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Maestría en Lingüística Aplicada a la Enseñanza del Inglés como Lengua Extranjera

Implementing Interactive Educational Computer Games in an EFL Classroom to foster Vocabulary Acquisition in sixth graders at "Víctor Gerardo Aguilar" school

Trabajo de titulación previo a la obtención del título de Magister en Lingüística Aplicada a la Enseñanza del Inglés como Lengua Extranjera

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Resumen:

El conocimiento amplio del vocabulario es la base para establecer una comunicación efectiva en Ingles. Sin embargo, los estudiantes, quienes han crecido en la era digital, experimentan aburrimiento y frustración al aprender el vocabulario del Inglés mediante estrategias tradicionales. Este estudio enfatiza la incorporación de juegos virtuales en un aula de clase que imparte el Inglés como lengua extranjera, como una estrategia innovativa, para ayudar a los estudiantes a superar el aprendizaje memorístico e incrementar la motivación. El objetivo principal de esta investigación fue descubrir la efectividad de los juegos computacionales educativos en la adquisición del vocabulario del Inglés. Para ello se aplicaron una previa y una posterior prueba a los participantes con el fin de medir su nivel del vocabulario en Inglés. La muestra poblacional incluyó 56 niños/as de sexto grado, quienes estudiaban en la escuela pública “Víctor Gerardo Aguilar” en Cuenca, Ecuador, durante el segundo quimestre del año lectivo 2018-2019. Esta población fue dividida en 2 grupos: experimental y control. El primer grupo aprendió el vocabulario del Ingles utilizando juegos computacionales, y el segundo grupo desarrollando actividades basadas en lecciones. Los resultados afirmaron que hubo diferencias estadísticas significativas en la prueba posterior de ambos grupos, pero el grupo experimental alcanzo un conocimiento del vocabulario superior en 19 puntos al grupo control. Además, los resultados del cuestionario, aplicados en una escala Likert de 5 puntos, revelaron que los niño/as estaban motivados y encontraron diversión para aprender el Inglés mediante juegos computacionales. Después de discutir los resultados de esta investigación y de otros estudios, se concluye que los juegos computacionales educativos son más efectivos para aprender el vocabulario del Inglés que los métodos usuales.

Palabras claves: Juegos Computacionales Educativos. Adquisición del Vocabulario. Motivación.

Abstract:

Broad vocabulary knowledge is the foundation to establish an effective communication in English. However, the students, who have grown up in the digital era, experience boredom and frustration to learn English vocabulary through conventional strategies. This study emphasizes the incorporation of virtual games into an EFL classroom, as an innovative strategy, to help students overcome rote learning and increase motivation. The main objective of this research was to find out the effectiveness that educational computer games represent for students' English vocabulary acquisition. To achieve this goal, a pre- and a post-test were conducted to measure the participants' English vocabulary knowledge. The sample of this study consisted of 56 sixth graders who studied at "Victor Gerardo Aguilar" public school in Cuenca, Ecuador, during the second semester of 2018-2019 academic year. This population was divided into two groups: experimental and control. The first group acquired English vocabulary through computer games and the second one performing lesson-based activities. The outcomes affirmed that there were statistical significant differences in the post-test of both groups, but the experimental group accomplished a vocabulary knowledge superior in 19 points than the control group. Also, the results of the 5-point Likert scale questionnaire revealed that children were motivated and found amusement to learn English through computer games. After discussing the results of this study and other related ones, it is concluded that educational computer games are more effective for learning English vocabulary than usual methods.

Keywords: Educational Computer Games. Vocabulary Acquisition. Motivation.

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Dedication:

I dedicate this research to my parents who have been a good example for me, and who have worked hard for my family's well-being.

Chapter I: Introduction

1.1 Background

Educational computer games have become one of the novel strategies to promote English vocabulary acquisition since they provide students meaningful realistic contexts of learning, requiring them to use latest technology and varied multimedia. Many studies have proved that virtual game-based learning approach is more beneficial and amusing than traditional methods for learning English vocabulary because it helps students overcome rote-learning, frustration, and anxiety as they trigger learners' desire for competition. (Alnatour & Hijazi, 2018).

In the 21st century English is acknowledged as the lingua franca through which knowledge is created and exchanged. Currently, there is a great demand for people in most countries of the world to acquire English as a Second or Foreign Language (ESL/EFL) through innovative pedagogical strategies (Bozkurt & Ataizi, 2015). For this reason, strengthening the academic program, the Ecuadorian educational system, in its Curriculum 2016, settled as mandatory the teaching-learning English as a Foreign Language through learner-centered and communicative approaches, not only in the secondary education as it was until 2015, but also in the primary education, in order to help students develop communicative skills effectively and succeed in today's globalized world (Ecuadorian Ministry of Education, 2016).

For Shahriarpour and Kafi (2014) the most important skill in the ESL/EFL area is vocabulary building because it enhances students' language comprehension and production skills. The more words, phrases, patterns, and lexical items learners acquire, the more competent they become when speaking and understanding the target language (Darfilal,

2015). Therefore, the mastery of vocabulary is the foundation to strengthen the four main language skills since by grasping the meaning of words and phrases learners process information efficiently and make correct choices to express ideas (Chui, 2013). However, instructing young learners to acquire new vocabulary requires a particular endeavor for teachers because the learning-activities and resources must fit their skills in the 21st century, considering that appropriate learning styles for people born in the digital era are learning by doing and learning through gadgets (Andreani & Ying, 2019).

Bearing in mind that the ability to speak English meets a modern world requirement, vocabulary development fosters effective communication, and the use of multimedia learning environment in EFL/ESL classrooms to instruct contemporary students has become absolutely imperative (Cope & Kalantzis, 2009), this research has been carried out to increase motivation and find the effectiveness of interactive educational computer games in sixth graders' English vocabulary retention and building.

Ashraf, Motlagh, and Salami (2014) conducted a quasi-experimental research, titled "The impact of Online Games in Learning English Vocabulary by Iranian (Low-Intermediate) EFL Learners", where twenty-four students, ranging from 16 to 22 years old participated. They were divided into control and experimental groups, each one involving 12 subjects. For fifteen weeks, the experimental group used the internet in the classroom to interact through role-play, social, history, and guessing games, whereas the control group learned new English words in texts and passages. The main objective of this study was to explore the efficacy of online games among EFL intermediate learners. The findings showed that online games were effective on vocabulary acquisition due to their interactive, creative, and motivating environment and due to the requirements learners should meet to

succeed in the game. So, students acquired new words during the virtual games because they participated freely and did whatever was necessary to understand the language and win the game.

A case study, entitled "Gamification in English Vocabulary Learning" was carried out in an EFL class with 31 undergraduate students and in a Business English class with 70 undergraduate students at Macau University in China. The aim of this study was to find out students' opinions and attitudes towards using online games when reviewing and learning English vocabulary, and its effectiveness to achieve life-long learning. Two online games: Fling the teacher and Jeopardy were used in these English classes to help both groups retain vocabulary. Through the first game, students worked individually or in pairs responding to questions with multiple-choice answers, and through the second game, students worked in teams interacting with one another to solve a problem. The results showed that most learners preferred using computer games to using printed worksheets to acquire English vocabulary because games were amusing, interesting, and motivating, and helped them remember new words easily. However, about 15 percent of the target students felt frustrated since games were timed, and they were still unfamiliar with ICT tools (Lui, 2012).

Another empirical study named "Video Games Promote Saudi Kids English Vocabulary Retention" was undertaken by Abdullatif (2017) with students from Saudi Arabia at a kindergarten level. The subjects of this research were sixty female children who were 5 to 6 years old. They were distributed in experimental and control groups, each one containing 30 participants. The purpose of this study was to investigate the impact of Video Games and their role on promoting Saudi children's English vocabulary retention. During

the intervention, the experimental group learned English vocabulary about parts of body, animals, colors, and family members by using selected video games from the official British Council site, while the control group learned the same vocabulary through conventional methods. The results revealed that children who learned in virtual environments became more successful in acquiring new words, compared to the subjects who did not. So, according to Abdullatif (2017) video games to learn English vocabulary are effective in children because they provide them rich video content, audio, animation, and direct feedback with correct answers, motivating pupils to go ahead and do more tasks.

In addition to these findings, in the field of teaching ESL/EFL many researchers like Lu and Chang (2016), Lin (2010), Alsharafat, Alrashdan, and Bani (2017), Benoit (2017), Korkmaz (2013), Franciosi (2017), Qteefan (2012), Yip and Kwan (2006), AlNatour and Hijazi (2018), and Vasileiadou and Makrina (2017) have already conducted research about the use of online games in classes, applying to different groups of students according to their English proficiency levels. These studies have found positive outcomes, revealing that computer games are efficient for learning English since they provide students meaningful contexts, enhance their motivation and self-confidence, and help them develop the skills which contribute to permanent learning.

1.2 Rationale

The above mentioned prior investigations and others executed to facilitate English learning through online games, indicate that the proposed topic is worth investigating because none of them has been specifically applied to sixth graders who are 9 or 10 years old, but to young adults and much younger children. Another interesting gap is that the

previous conducted studies used only specific games to help students retain vocabulary; for instance, Jeopardy, Fling the Teacher, video games, guessing games, and history games. However, it is better to include different sorts of interactive educational computer games in the EFL classroom, in order to provide students with plenty of opportunities to engage with words and phrases. Besides, using different types of online individual and team games in EFL classes is more effective to increase students' motivation, to facilitate authentic communication practices, and to break routine exercises (Benoit, 2017). Unlike other existent studies, this research will help children recall and acquire not only words and simple phrases, but also communicative patters of language.

Moreover, this study is relevant because of the following contributions to the English as a Foreign Language Area in our Educational System: 1) it will provide EFL instructors a bridge to move from classical classroom settings to innovative pedagogical scenarios, and 2) it will help English teachers meet students' expectations in the digital era, in the way that it will make children explore virtual contexts not only to have fun by watching videos and playing non educational games, but also to perform their academic tasks, thus allowing them to go beyond classroom walls and traditional textbooks.

1.3 Purpose

The purpose of this study is to find out the effectiveness that interactive educational computer games represent for sixth graders' English vocabulary acquisition at "Victor Gerardo Aguilar" school, and to assess students' motivation to learn English vocabulary by means of this novel approach.

1.4 Statement of the problem

Broad vocabulary knowledge is the foundation for students who are learning a Second or Foreign Language since it facilitates efficient communication and determines their language proficiency. Hence, there is a connection between students' language proficiency level and vocabulary growth (Chuan, 2006). Likewise, to emphasize vocabulary training, Eide (2010) manifests that if students' grammar is incorrect, they might still be understood; if their pronunciation is flawed, they still may be able to communicate, but if their vocabulary is deficient, misunderstandings may arise, and communication may become defective.

Yip and Kwan (2006) point out that learning English vocabulary by means of conventional strategies such as translation, memorization, and repetition drills is usually perceived as boring and frustrating, especially for the students who have grown up in the digital era. So, these learners can confront a tedious experience when learning English, as they have to memorize unknown words, phrases, and spelling, in order to carry out lesson-based activities.

In addition to this aforementioned drawback, it is imperative to describe my own experience as an English teacher for thirteen years in urban and rural Ecuadorian public schools in Azuay province. During my teaching practices, I have noticed that students' English vocabulary becomes intermittent because they cannot recall when they need it for future classroom practices. In this way, I have perceived that traditional material resources and usual strategies do not help students acquire new English vocabulary spontaneously. For example, the use of flashcards, charts, notebooks, English textbooks, physical

dictionaries, board, and markers; and also, the application of strategies such as translanguaging, translation, labeling pictures, identifying synonyms and antonyms, and drawing pictures are not enough to construct a motivating classroom atmosphere with authentic communicative practices. Besides, students need to learn English in a suitable way that copes with the modern world technologies.

For these reasons, it is essential to reinforce English vocabulary training through effective innovative strategies like interactive computer games, which build up children's learning process by strengthening their retention of new vocabulary and providing them a productive learning climate that demands fun and reduced anxiety (Sharahriarpour & Kafi, 2014).

1.5 Research Questions

The aim of this research is to find out the effectiveness that interactive educational computer games have for sixth graders' English vocabulary acquisition at "Victor Gerardo Aguilar" school, and to assess students' motivation to learn English vocabulary through this innovative strategy. The following research questions are posed to meet the objectives:

1. How effective are interactive educational computer games for sixth graders' English vocabulary acquisition at "Victor Gerardo Aguilar" School?
2. Do interactive educational computer games motivate students to learn English vocabulary?

1.6 Hypothesis

1. Interactive educational computer games are highly effective to strengthen sixth graders' English vocabulary acquisition since they illustrate the target vocabulary in authentic communicative contexts through text, voice, animation, video, and other multimedia features.
2. Interactive educational computer games do motivate students to learn English vocabulary because they provide students with realistic and entertaining learning scenarios where they become fully engaged with immediate competitive activities to get rewards.

1.7 Objectives

General:

- To find out the effectiveness that interactive educational computer games represent for sixth graders' English vocabulary acquisition at "Victor Gerardo Aguilar" School.

Specific:

- To determine experimental group students' English vocabulary acquisition through interactive educational computer games.
- To determine both groups of students' English vocabulary performance after intervention.
- To measure experimental group students' motivation to learn English vocabulary through interactive educational computer games.

Chapter II: Theoretical Framework and Literature Review

The theoretical framework of this investigation describes three influential learning theories of Second Language Acquisition (SLA), the importance of integrating technological tools in the teaching-learning English as a Second or Foreign Language, the definition and types of educational computer games, and the pedagogical benefits of using educational computer games in ESL/EFL classrooms.

2.1 Influential Learning Theories on SLA

2.1.1 Steven Krashen's Theory of Second Language Acquisition

For VanPattern and Williams (2007), one of the most prominent theories on SLA is Steven Krashen's study, which was developed in the 1970's (as cited in Eide, 2010). This theory encompasses five hypothesis that mention how Second Language Acquisition and Learning takes place. They are the Acquisition hypothesis, the Input hypothesis, the Natural Order hypothesis, the Monitor hypothesis and the Affective Filter hypothesis. This research emphasizes the two hypothesis that mainly support Second Language Acquisition.

The first theory, the Acquisition hypothesis, highlights the difference between two Second Language systems, the acquisition and the learning system. In the first one, students acquire the Second Language (L2) in the same way they get the First Language (L1), naturally, subconsciously, and communicating in real-life contexts. The formal classroom instruction and intentional understanding of language form are excluded from this process. For instance, the acquisition of ESL/EFL takes place when students are living in an English-speaking country, picking up the target language while interacting with others in authentic communicative situations. In such circumstances, these students are not conscious

of the fact they are acquiring the L2, but they are aware that they are using the L2 to communicate. On the other hand, the learning system focuses on getting the target language consciously in a formal classroom instruction, knowing the rules of the language. This kind of training provides students intermittent results. So, acquisition is better than learning because it contributes to long-lasting learning (Eide, 2010). This hypothesis is relevant to the current research because online games provide children genuine contexts where they can acquire language incidentally. Namely, through digital games students' involvement and interaction with language becomes easy and natural when they perform fun and challenging activities during the game. The fact that online games present highly engaging activities, the students' learning will become permanent.

The second hypothesis, the Input hypothesis, involves only acquisition, not learning, in which L2 learners move from *i* stage to *i +1* level. According to Schütz (2019), this process represents *i* as input (the student's L2 current level of linguistic competence) and *i + 1* as the comprehensible input (comprehension of new language that allows the learner to progress their L2 present stage). For instance, children's vocabulary knowledge about professions is the input, while their comprehension of videos that show students describing their family members' professions or occupations becomes the comprehensible input. This means that students acquire the L2 by exposure to new vocabulary that is understandable and meaningful to them (Tricomi, 1986). This hypothesis is amenable to this research because during virtual games topics are placed in situations that emphasize meaning rather than form.

2.1.2 Vygotsky's Socio-Cultural Theory

For Vygotsky (1978), the influence of playing on children's progress is significant because it creates the zone of proximal development (as cited in Benoit, 2017). During play pupils act beyond their intellectual and emotional age and behavior. Since learning is innately social in nature, children assimilate new information successfully by performing normal activities in their immediate social contexts. So, children construct knowledge by interacting with people (peers and adults) and using objects that are present in their environment. Also, to develop complex language skills children are provided with appropriate scaffolding and modeling by adults and more advanced peers. Hence, the foundation for students' meaningful learning depends on their interaction with other people (Vygotsky, 1978). In this regard, game-based learning through social constructivism intensifies the interaction among players and games, which are socially produced as students acquire new knowledge in social scenarios (Benoit, 2017).

2.1.3 The Connectivism Approach to English Language Leaning and Acquisition

Connectivism as a learning theory of digital age describes how learning is developed through network connections and lets students acquire knowledge by using web 2.0 tools, software platforms, virtual applications, and other digital learning resources in order to foster students' autonomy, creativity, collaboration, interaction, and engagement with content. Technological gadgets, the internet, the webs, and information and communication technologies (ICT), which are part of the global factors in this current transformation era, contributed to the birth of a new generation, that internalizes technology in most areas of their lives, including education (Bozkurt & Ataizi, 2015). Besides,

technological innovations in software and hardware generated novel means for communication and new spaces for learning which have been exploited by educators and learners gradually all around the world, in order to enhance their learning environments with digital technologies (Motteram, 2013 as cited in Buzkurt & Ataizi, 2015).

Connectivism for English language learning offers an approach similar to natural language acquisition founded on connection, interaction, collaboration and meaning making. Web 2.0 and 3.0 tools allow language learners to harness the available information on webs, social networks, and free virtual applications, in order to meet their immediate learning needs. For example, a language learner can access to voki application freely to practice and improve the pronunciation of phrases in the target language by listening to an avatar. Additionally, language learners can exploit the social software tools to access other language users with whom they can practice the four main language skills through interaction and knowledge sharing (Pim, 2013 as cited in Buzkurt & Ataizi, 2015).

Web 2.0 and 3.0 tools are used to foster second or foreign language acquisition. Thus, to improve listening skills podcasts and online radios, as a source of authentic oral models, assists learners with pronunciation, acquisition, and reinforcement of new vocabulary of the target language. Vlogs provide sounds and dynamic visuals which helps learners to see gestures and mimics to make meaningful connections with content. Likewise, this kind of virtual material presents the written form of the actions which aids learners to catch the content and see the differences between the written and spoken forms of the target language. Moreover, volp tools like Skype help learners enhance oral communication skills when they have real time interaction and get immediate feedback from other learners, especially from native speakers of the target language. Also, wikis, blogging, and

microblogging support learners in the writing process, organization of ideas, reflection of thoughts, and content creation. (Bozkurt & Ataizi, 2015).

The connectivism approach supports this investigation because educational online games fit with the modern high-tech globalized world, which influences greatly children and teenagers' lives. In addition, online games are part of today's virtual learning environments that provide students useful comprehensible input to understand vocabulary and improve their comprehension and creative skills. These games combine attractive multimedia features to present interactive simulations of the real world, that can be accessible for learners through various ubiquitous devices as digital technologies attempt to transform education and learning.

2.1.4 The importance of integrating technological tools in SLA

Accelerated advancement in communication and information technologies have affected people in all aspects of life, including the educational field. This has brought novel ways of acquiring knowledge by using different multimedia and ubiquitous learning environments. So, most educational institutions have been adjusting their system to these new technological trends and the use of web 2.0 and 3.0 services. They have been incorporating technological tools in their learning scenarios and virtualizing the didactic materials, in order to make students' learning more efficient. Besides, young learners are growing up with these new tendencies, and most of the technological devices and social networks have become an integral component of their lives (Qteefan, 2012). Also, language educators have been updating their knowledge to be able to use the different software platforms and

applications, the available web pages, and social networks, in order to adjust contents and methodologies to digital natives' needs.

At present, English is acknowledged as the most spoken language on Webs as well as the lingua franca in the modern world. So English instructors should exploit all the available contents, the technological applications, and the software tools for connectivity, in order to provide learners lots of exposure to authentic English contexts and to make the language learning process more dynamic, since the contemporary globalized society facilitates people's knowledge growth and exchange through English. (W3Techs', 2013 as cited in Buzkurt & Ataizi, 2015).

2.2 Educational Computer Games

2.2.1 Definition of Educational Computer Games

Qteefan (2012) defines Educational computer games as digital applications displayed on the computer screen, that have been designed for educational purposes to let individual or team players pursue goal-oriented activities. They are also considered as cooperative and communicative video games that require players to use language for interaction while they get involved in tasks. Besides, educational computer games are regarded as innovative tools and supporting materials for learning, which allow students to have concentrated practices of the target language and opportunities for real communication, building a bridge between the classroom and the real world.

Additionally, Erhel and Jamet (2013) describe educational computer games as software applications, designed to create attractive and motivating learning experiences, in order to meet specific objectives in educational practices successfully. These games can be devised

either to promote learning or to be used as simulations enabling learners to practice their cognitive abilities in virtual settings (as cited in Papadakis, 2018).

2.2.2 Types of Educational Computer Games

For Gross (2007), scholars and game designers have employed a varying taxonomy to classify games, but most of them have agreed on the following seven types of computer games (as cited in Vlachopoulos & Makri, 2017).

-Role-play games: In these games players have to take roles of imaginary characters.

-Action Games: Video games that require players to undertake physical challenges.

-Adventure Games: Require players to solve problems in order to move on to the next level.

-Sport games: They are based on different kinds of sports.

-Simulations: They are software applications, used to reproduce real-life activities and actions in the form of games.

-Fighting games: They involve combats between two fighters or group of fighters.

-Strategy games: They recreate fanciful scenarios, where players must contrive an appropriate strategy to achieve a specific goal.

2.2.3 The Pedagogical Benefits of Using Educational Computer Games

It has been found that educational computer games propose a number of potential benefits for language learners. Thus, Bradshaw (2004) alleged that computer games intensify problem-solving, memory retention, interaction, concentration, self-expression, autonomy, motor skills development, organization, and cooperation (as cited in Qteefan, 2012, pp 41). In addition, Lui (2012) mentioned that computer games offer learners the opportunity to turn negative emotions into positive ones when they experience that results

are accomplished with immediate feedback and repeated attempts. Lin (2010) found that computer games depict linguistic information not only in words, but through sounds, images, animation, and videos which aids learners to achieve better comprehension and retention of unknown vocabulary. Akdogan, (2018) pointed out that educational virtual games bring real world context to the classroom enabling students to use the target language instead of just thinking about the correct forms of expressing ideas. Watson et al. (2011) revealed that educational computer games reverses the traditional teacher-centered learning approach by situating students in immersive and encouraging learning environments, which let them engage deeply with contents and take the opportunity to practice the target language independently in and outside of the classroom and at their own pace (as cited in Huang and Huang, 2015). Also, for Reynolds (2017) digital gaming with a range of environments resulted to be the main source of incidental vocabulary acquisition, specifically when it provides L2 learners repeated target vocabulary exposure.

2.2.4 Criteria for choosing a Computer Game

Indeed, it is necessary to select appropriate digital games to achieve successfully the main objectives proposed with a specific group of students. Among them are the number of students in a class, the learning topic, the learners' English proficiency level, the timing, the classroom setting, the cultural context, and the available resources. (AlNatour & Hijazi, 2018).

2.3 Literature Review

2.3.1 Empirical studies on Virtual Games to foster English Vocabulary Acquisition

Many investigations have been undertaken on the effects of using educational digital games to enhance ESL/EFL vocabulary instruction because they follow the new trends of technology and innovation to up-to-date educational practices constantly (Papadakis, 2018). But, the literature review of this paper emphasizes eight relevant empirical studies from 2006 on, conducted on digital game-based learning to foster English vocabulary acquisition, each one applied to students of different English proficiency levels.

Korkmaz (2013) carried out a research titled, "Language games as part of Edutainment" to investigate primary school children's opinions about learning English through online games, and to find out if there is an agreement between children's and English language teacher's perspectives when using this active strategy. To this end, a questionnaire about the experience with edutainment (video games devised for teaching and learning a specific skill or knowledge) was administered to 121 fifth graders from three different primary schools in Turkey and to 60 experienced language teachers from the same country. The findings of this study revealed that children needed fast, active, adventurous, and exploratory activities to meet their learning demands. When tasks were addressed to them by using conventional methods, they had little meaning and did not fulfill their objectives; however, when their activities implied interactive edutainment, children felt natural attraction and achieved goals successfully. Therefore, when children were fully engaged in game-based learning, they did not focus directly on the language form, rather the games provided the meaningful and fun context they required, prompting them to take risks in

language practice. Also, in this study L2 teachers and parents recognized that ludic tasks promoted children's development of strategic thinking and communication skills. Lastly, this investigation reported that both teachers and students agreed to the following statements: 1) Young learners love it when instructors teach English through digital games; 2) Ludic principles for successful games imply setting rules, cooperation, competition, fun elements, and teachers' demonstrations; 3) Any subject can be taught through game-based lessons; 4) When children read English texts through games they comprehend better; and 5) Pupils are not disturbed by the noise when they are playing virtual games.

Yip and Kwan (2006) in their research "Online vocabulary games as a tool for teaching and learning English vocabulary" investigated the usefulness of virtual games in English vocabulary learning, applied to undergraduate students at Hong Kong University. To facilitate students' vocabulary acquisition, these investigators used two websites developed by the English Center of this university, which contained virtual vocabulary games such as card matching, treasure hunting, puzzles, crosswords, and space invaders. After the intervention, they found out that Computer-Assisted Language Learning, CALL, was a supplemental tool, used to alleviate the trouble of rote learning vocabulary in SLA. Also, they discovered that online games helped students pay more attention and be prompted by a continuous motivation in the learning process. Additionally, these investigators considered that if virtual games were fun, relaxing, and confidence boosting, the students' interests would be elevated, and retrieval information would be obtained automatically. To assess validity of this approach, a pre-test and post-test were applied to 100 freshmen students at Hong Kong University. The groups were arbitrarily divided into three experimental groups and three control groups. The first three groups were required to learn selected vocabulary

from specific websites; conversely, the second three groups were expected to learn vocabulary doing lesson-based activities. The outcomes of this study suggested that learning vocabulary through websites containing digital-games was more productive than learning by means of simple lesson-based activities.

Another empirical research, called "The effect of computer game-based learning on foreign language vocabulary transferability", developed by Franciosi (2017) revealed that instructional approaches using computer games in L2 classrooms supported vocabulary retention and transferable skills. Two observations were regarded to explain the achievement of these skills. First, grounding in his research, this author stated that students' ability to recall the new vocabulary learned in a computer game and their competence to use it in a real communicative situation resulted an indicator of skill mastery. With further observation, he asserted that students' capacity to employ the new vocabulary in a variety of communicative contexts constituted evidence of transferability skills. This means that the more interconnected a target language word becomes, the more transferable it is. Also, this study revealed that the presence of non-linguistic sensory information together with target linguistic constructs enhanced students' vocabulary development and retention of information. To see this positive impact, two studies were conducted in EFL classes at a Japanese University using computer game-based lessons. The first one was a quasi-experimental study, that compared the use of target words in a writing task between a group of students who took part in a computer game-based activity and a group of learners who did not. The second study was a cross sectional analysis that compared the use of new vocabulary in a writing task with increased participations in computer game-based

activities. The outcomes of this research demonstrated that online simulation games applied in L2 classrooms enhanced transferability of new learned vocabulary.

Next, the study, "Role-Play Game-enhanced English for Specific-Purposes Vocabulary Acquisition Framework", carried out by Lu and Chang (2016), demonstrated that in English for Specific Purposes learning contexts Role-Play Games were efficient for vocabulary acquisition. According to these investigators, "ESP uses a learner-centered and content-based approach to teach EFL, where authentic materials and specific knowledge are applied, so that students can make progress in the current world" (p.367). Also, this research affirmed that authentic resources illustrated how English was naturally used by native speakers, and one of the most challenging tasks constantly facing ESP teachers was how to bring authentic materials into the classroom. So, the implementation of RPGs in ESP scenarios has helped teachers find the solution since this approach offers authentic materials related to specific subjects. Likewise, RPGs have provided students a setting for constructive learning by immersing them in meaningful communication simulated to authentic practices. To see the benefit of RPGs in ESP contexts, a RPG-enhanced ESP vocabulary acquisition framework was developed, based on semantic, communicative, and situational sets. To evaluate the framework effectiveness, a pre-test and a post-test were conducted on 80 Taiwanese second-year high school students, divided into an experimental group and a control group. The results confirmed that RPGs placed learning in authentic contexts, and vocabulary items presented in systematic ways and related to real-life situations were easier for students to acquire.

Also, AlNatour and Hijazi (2018) in their research, entitled "The impact of using electronic games on teaching English vocabulary for kindergarten students", found that

electronic games demanded students' engagement and dynamic participation using the curriculum material in specific contexts, in order to promote transfer. According to this study, when students apply the vocabulary and the different structures of the target language on virtual games, the gap between the ideas learned in a classroom and the difficulty to apply the same concepts in real life situations is likely to disappear, since online games approach real-life contexts. These authors investigated the effects of using online games on kindergarten students' English vocabulary acquisition. To reach this goal, a pre-test and a post-test were administered to 100 kindergarten students in private schools in Irbid, Jordan, during the first semester of the 2016-2017 academic year. The population was divided into two experimental groups and two control groups. The treatment was applied for eight weeks, where the experimental groups learned English vocabulary through digital games, and the control groups studied the same topics by means of drill practice. The results revealed that the experimental groups scored higher on English vocabulary performance than the control groups. Moreover, this research demonstrated that there were not statistically significant differences on the achievement due to gender of students. Finally, these researchers noticed that inserting English language learning in early years resulted in children's increased self-confidence, dynamic learning, and active involvement in the society.

Additionally, Wei, Kao, and Lui (2018) found that learning English vocabulary through repetitive exercises led to boredom, anxiety, and difficult concentration. To eradicate these negative effects on students, these investigators carried out a study, titled "The effects of competitive gaming scenarios and personalized assistance strategies on English vocabulary learning". So, they incorporated in their lessons the online competitive board game,

Monopoly, with personalized assistance, in order to discover whether the two together would work as a means of reducing learners' anxiety and improving their concentration and learning outcomes. One hundred twenty university students from Taiwan, ranging in age from 19 to 26, were recruited to undertake this intervention, who were divided into experimental and control groups. The results showed that both the incorporation of competitive online games into English vocabulary instruction and the personalized assistance by the teacher did help students strengthen their learning outcomes, reducing anxiety and making them recall new English vocabulary effortlessly. So, the interaction of these two factors did contribute to a better learning performance that was superior to when personalized support alone was given.

Besides**,** Vasileiadou and Makrina (2017), as teachers and investigators, noticed that in Greek primary schools, children were taught English vocabulary only by performing typical coursebook exercises, in which they were unwilling to move forward learning English. In an effort to relieve this unfavorable situation, these authors undertook a research, titled "Using online computer games in the ELT classroom". The aim of this study was to find out the effectiveness that online computer games had to motivate and assist children in learning English vocabulary, compared to the workbook activities proposed by the Greek national curriculum. A pre-test, a post-test, and a semi-structured interview were applied to 35 fourth graders of two primary schools, located in the outskirts of Orestiada, Greece. The participants were allotted to an experimental group with twenty children and a control group with 15 ones. Specifically, the semi-structured interview was conducted to the experimental group, in order to know their opinions towards learning English by means of online computer games. Meanwhile, the pre- and post-tests were applied to measure the

participants' English vocabulary knowledge prior and after the treatment. For twenty-four weeks the experimental group learned English vocabulary by playing relevant online computer games, and the control group by performing usual vocabulary exercises suggested by the school's curriculum. The findings revealed that computer games were more productive to learn English vocabulary than any other strategies recommended by the Greek national curriculum, not only because they boosted students' motivation, but also because they assisted children in retaining new English words. Conversely, the workbook exercises, proposed by the Greek national curriculum, were regarded as boring by young learners, leading them to poor outcomes in their English achievement. In addition, these researchers discovered that virtual games provided students the comprehensible input they needed to progress linguistically in the English language.

The last study implied in this literature review is "A video-based CALL for proficient and less proficient L2 learners", which points out the effects of video-based CALL (Computer Assisted-Language Learning) activities on L2 learners' incidental vocabulary acquisition. Lin (2010), this study's author, considered Incidental Vocabulary Acquisition as learning without an intent to learn. According to the findings of this research, when learners watch video games, they are exposed to aural and visual contexts perceiving English words and phrases simultaneously through images and sounds. Due to this multi-sensory support, vocabulary can be acquired incidentally and efficiently. The outcomes of this study found that visual information was beneficial for less-proficient students and could particularly assist them when affronting complex texts. To ensure validity of this innovative approach, a pre-test and a post-test were administered to 44 proficient L2 learners and 39 less proficient learners from a Taiwanese University. After being exposed

to video-game lessons during five sessions, the results demonstrated that VBCALL (Video-Based Computer Assisted Language Learning) programs had a significant impact on less proficient language users than their proficient counterparts in reading comprehension. With regards to vocabulary acquisition, both proficient and less proficient students achieved significant improvements in adjectives, nouns, verbs, and other vocabulary words.

In sum, these previous studies contribute to this research by asserting that virtual game-based learning approach is more efficient for L2 vocabulary acquisition than conventional methods since it presents amusing and relaxing scenarios for learning. Besides, this literature review demonstrates that computer games support vocabulary learning because they display information through different multimodal features such as words, images, sound, animation, video, and other interactive elements, which are indeed better at capturing students' attention than traditional textbooks. Therefore, these research open avenues to find out effective and innovative strategies through ICT tools, in order to help students acquire the English language successfully. For instance, they have encouraged the investigator of this research to explore the existent platforms such as Educaplay, Nearpod, Word wall, Factile, Genially, Class craft, etc., which allow users to create their own educational online games and other interactive activities. Thus, signing up for free in these platforms, teachers can create their own educational games, which can adjust to their students' interests and needs.

CHAPTER III Methodology

This chapter deals with the materials, methods, procedure, and other relevant aspects implied in this study. They are the research design, the context, the participants, the ethical considerations, the innovative methodology applied to students of the experimental group, the measurement tools, data collection, data analysis, and results. Specifically, it describes how the effectiveness of virtual game-based approach was measured, and how students' motivation and fun perception were assessed. Also, it comprises the control and experimental groups' performance before and after the intervention.

3.1 Research Design

This study used a quasi-experimental approach since it implied two groups of students: the experimental group, that acquired English vocabulary through interactive educational computer games, and the control group, that learned English vocabulary developing lesson-based activities. Besides, the subjects in each group were not randomly assigned, but the researcher used two existent parallel groups, designating the first one as the experimental group and the second one as the control group. According to White and Sabarwal (2014), the lack of random assignment is a characteristic of the quasi-experimental design.

Also, this investigation took a quantitative approach since the tools: Vocabulary Knowledge Scale (VKS) and the 5-point Likert Scale questionnaire involved quantitative data to process information and present results. Through the VKS, a pre-test and a post-test were administered to the target groups of students; the first one to compare the mean scores of the two groups prior to treatment, and the second one to determine the effects of computer game-based approach in the outcomes of the experimental group. A second

instrument, the 5-point Likert Scale, was applied to discover if educational computer games motivated students to learn English.

3.2 Context

The setting of the present research took place at "Victor Gerardo Aguilar" public school, located in Cuenca, Ecuador. Since its creation in 2013, "Victor Gerado Aguilar" school has been a big educational institution offering students primary and secondary education in two schedules: morning session and afternoon session. Currently, this school has 1640 enrolled students and a staff of 65 teachers. The students' population encompasses not only native Ecuadorians, but also 10% of foreign learners. Among them are Colombians, Philippines**,** Venezuelans, and Peruvians. The school levels include kindergarten, Basic Education ranging from 1st grade to 10th grade, and Baccalaureate preparing teens in three careers: Computer Science, Electro Mechanics, and Basic Science.

Concerning technological resources, this school has three computer labs, particularly for students who are pursuing the Computer Science and Electro Mechanics careers. Besides, all these three computer labs have good internet connection to work with students. Schedules to use these labs with students are available in the morning session because the students of the baccalaureate level have classes in the afternoon. Facilitating the present investigation, one computer lab was used to work with the experimental group during the second semester of the academic year 2018-2019.

Since 2016, "Victor Gerardo Aguilar" School has used an Open and Flexible Curriculum provided by the Ecuadorian Ministry of Education, which means that it is not mandatory for Ecuadorian schools to study all the contents within an estimated time,

instead teachers can adjust the topics to the learners' demands. For instance, if a learner has special needs, the educator can accommodate this student's learning only to develop the indispensable skills; on the other hand, if a learner has an advanced level of knowledge in relation to his/her classmates, the teacher can implement other activities, which allow this learner to develop other skills that go beyond the required ones. Additionally, to accomplish the learning objectives with students, the open and flexible curriculum lets teachers select and use appropriate activities, strategies, didactic resources, and technological tools, those that best work with their groups of learners.

3.3 Participants

This study used a sample of 56 sixth graders, enrolled at "Victor Gerardo Aguilar" school during the academic year 2018-2019, all of them being native Spanish-speakers, living in Cuenca, Ecuador. Since this population was already divided into two groups, 28 children from sixth "B" and 28 from sixth "C", the researcher used the group "B" as the control group and group "C" as the experimental group. Both groups had male and female students who were ten or eleven years old. There were twenty boys and eight girls in the control group, whereas the experimental group had eighteen boys and thirteen girls. It is important to mention that "Victor Gerardo Aguilar" school have always had three groups of students for sixth grade: group "A", group "B" and group "C"; however, the investigator did not select the group "A" to develop her research because she was not in charge of those students to teach English during the school year 2018-2019. So, the researcher used a convenience sampling to choose the groups of students for her investigation because of two reasons: First, she was in charge of the two selected groups to teach English during that

academic year; and second, the availability of space to use the computer labs matched the English classes schedule of the experimental group. Thus, during the intervention there were not problems to work with students of the experimental group in the computer labs, since these children had English classes until 11H:00 AM, and the computer labs were used by students of the baccalaureate level after 11H: 30 AM.

3.4 Ethical Considerations

To execute this study the following ethical considerations were regarded. First, the principal of "Victor Gerardo Aguilar" school granted permission to carry out this treatment, warranting a secure atmosphere for all participants. Then, the researcher informed the morning session vice-principal, the sixth grade "B" and "C" tutors, and the target students about the purpose and the overall procedure of this investigation. After that, she sent each student of both groups a consent form written in Spanish requesting their parents' authorization to take part in this study. All target students' parents signed the written consent for their children to take part in this experiment. Besides, the researcher explained students that their participation would not interfere with their final grades of the English course and that their personal information would not be divulged in any way. To protect data, the researcher changed the students' names for codes to secure anonymity.

3.5 Measurement Tools

This investigation used a pre-test, a post-test, and a Likert scale 1-5 questionnaire as tools to collect data. The pre-test and the post-test were quizzes designed according to the Vocabulary Knowledge Scale (VKS) instrument (an adapted version of Paribakht & Wesche, 1993, in Read, 2007), in order to assess how well the students of the experimental

and control groups know the target English vocabulary words before and after the intervention. The VKS is a 5-point scale report, where items are used to obtain demonstrated knowledge of specific vocabulary words. It fundamentally measures the gradual degree of vocabulary knowledge, where level I indicates that learners do not know anything about the word, whereas the three next levels: II, III, and IV mean that the students recognize the word. The top-level V demonstrates that learners can use the word in a context with grammatical and semantic accuracy (Iqbal & Komal, 2017).

Figure 1 shows the scale used to assess the target students' English vocabulary knowledge before and after the treatment.

CATEGORIES		WORTH
I	I do not know what this word means.	1
II	I have heard this word before, but I do not know what it means.	2
III	I have heard this word before, and I think it means: _____ (synonym or translation).	3
IV	I know this word. It means: _____ (synonym or translation).	4
V	I can use this word in a sentence: _____.	5

Figure 1 *VKS categories (an adapted version of Paribakht & Wesche, 1993 in Read, 2007).*

The VKS (an adapted version of Paribakht & Wesche, 1993 in Read, 2007) is a reliable and valid instrument since it has already been used in other prior studies to measure students' vocabulary knowledge as in "Vocabulary Learning with special attention to Norwegian Pupils" by Eide (2010) and "Learning and Enhancing Vocabulary through extensive reading" by Iqbal & Komal (2017).

Regarding the 5-point Likert scale questionnaire, it was employed at the end of the intervention to find out whether interactive educational computer games motivate the students of the experimental group to learn English vocabulary. Likewise, it was used to assess students' fun perception when learning English vocabulary by playing computer games. The five points of this scale measurement were categorized as follows: strongly agree (being the highest), agree, neither agree nor disagree, disagree, and strongly disagree (being the lowest in the scale).

Figure 2 depicts the 5-point Likert scale questionnaire, employed to assess experimental group students' motivation and fun perception to learn English vocabulary through interactive computer games.

LIKERT SCALE QUESTIONNAIRE Rate your opinions about how much you agree or disagree learning English Vocabulary through interactive educational computer games. For each statement mark an X below a scale point.					
STATEMENTS	**Strongly agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
Interactive educational computer games motivate me to learn English vocabulary.	☐	☐	☐	☐	☐
It is fun to learn English vocabulary through interactive educational computer games.	☐	☐	☐	☐	☐

Figure 2 *Likert Scale to assess experimental group students' opinions towards learning English vocabulary through educational computer games.*
Source: Maria Celia Carrasco

3.6 Data Collection

This study was conducted during ten sessions in an English class that met three hours a week. In the initial treatment session, the two target groups were pretested on vocabulary knowledge concerning 36 new words, distributed as follows: nine elements about parts of the body, nine food items, nine jobs, and nine clothing items. This test used the Vocabulary Knowledge Scale (VKS) instrument (an adapted version of Paribakht & Wesche, 1993 in Read, 2007).

Next, during eight sessions the children of the experimental group acquired English vocabulary through interactive educational computer games, whereas students of the control group learned the same vocabulary only through drill practice and lesson-based activities. The experimental group took English classes in a computer lab, and the following educational computer games were chosen from websites by the investigator who was in charge of teaching English to the target students during the academic-year 2018-2019. From https://www.gamestolearnenglish.com four individual games were chosen to help the experimental group acquire the target vocabulary. They were spelling bee game, matching game, concentration game, and hangman game. All these virtual games included audio, text, animation, and sensory images where students can not only learn new words and phrases, but also practice listening, reading, and writing skills. Besides, these online games presented an option for students to review the vocabulary items of a topic first, before playing the game.

The first individual game was the spelling bee game. To start playing it students had to select a topic. Once they had clicked start, the screen depicted the image of a word and its

English pronunciation was heard. So, students had to spell the English words quickly. There was also a timer that ran down while students were playing the game. When students were making progress on the game by spelling the words correctly, the countdown timer got faster, and the game became more challenging. Once students had finished spelling correctly all the words of a selected content, the game ended, and the score appeared on the screen. However, if the timer ran out before spelling all the words, students lost the game.

The second individual game was the matching game, which offered students a quick and easy way to practice new vocabulary words or phrases. It provided them audio, image, and text for each word or phrase. There were two ways of playing this game. First, students had to click and drag the images to the matching words or phrases rapidly. Whenever an image was matched with its correct word or phrase an audio was played. But, if the picture was dragged to the wrong word or phrase, an x appeared. Second, a word or phrase was displayed on the screen along with its English pronunciation, and below it a group of ten images were presented. So, students had to click on the matching image of this word or phrase very quickly. What made this game more interesting and challenging was the timer. The game got faster as students made progress, and if they did not click quickly enough on the matching images, the game was over.

The third individual game was the concentration, which allowed learners to associate words with pictures simultaneously. For each content, this game presented a set of twenty-four squares where learners had to click on the squares to find pairs of pictures-words as quickly as possible. Whenever learners discovered a matching pair picture-word, they got points, and the two squares disappeared. The concentration part came when learners had to

remember where the pictures or words were located among the twenty-four squares. It was challenging because the time students had to match all pairs pictures-words ran down very quickly and they had to move faster and faster to win the game.

The fourth game was hangman, in which students had to guess the letters of sixteen hidden words. To start this game, learners had to choose a topic. Once a content was selected, a screen of the game appeared, where letters were presented in two sets: vowels were on the left side and consonants on the right side. Also, a set of blank letters was in the middle of the screen. To win the game, students had to guess the letters of all the sixteen secret words before the man was hung. To make this game easier, wrong guesses from vowels were not considered as mistakes. So, it was recommended for students to click on all the vowels first. During the process of the game, if learners picked a letter that was part of the hidden word, a sound was played, and that letter was revealed from the blanks. But, if learners clicked on the wrong letter, a stickman was slowly drawn. While more wrong answers students got, more parts of the man were added. Once the man was finished, he was hung, and the game was lost. In contrast, whenever students guessed all the letters of a word correctly before the man was hung, they could move on to the next word until they could disclose all the sixteen secret words and win the game. Additionally, for each revealed word an image of it was displayed along with its English pronunciation.

The fifth individual game was wordsearch. To adjust this game to the contents studied in classes, the investigator created four interactive wordsearches in the platform Word wall, which lets users create up to five free games. Each wordsearch contained thirteen vocabulary items about one of these topics: body parts, food, jobs, and clothing items.

These interactive activities displayed unrevealed words in a grid, which were in horizontal, vertical, and diagonal form. To complete each wordsearch, learners had five minutes to mark all the thirteen words that were hidden in the grid. In addition, these virtual games presented pictures of the undisclosed words, which were used by students as clues to guess the vocabulary items.

The last game the researcher used in her investigation was the team game, jeopardy. As it was difficult to adjust the existent jeopardy games to students' contents, the investigator created two Jeopardy games according to the target topics using the webpage https://www.playfactile.com. Each jeopardy contained six category words including five questions each one, becoming a total of thirty vocabulary items. For example, the name of the first jeopardy was English vocabulary one, and it encompassed the category words: Food one, food two, body parts one, body parts two, clothes and jobs, each one containing five questions such as how do you say this food item in English? What do you wear on your feet? Who works at school? Who fixes cars? Who takes care of gardens? Who assists patients at the hospital? and What body part we smell with? It is important to mention that each question presented two answer choices, from which students had to select the correct one. Also, to make this game easier, a picture of the right answer was included. The questions were arranged from the least difficult to the most difficult, and a dollar value was assigned to each answer ranging from $ 100 to $500. The members of each team had 20 seconds to respond each question. Whenever a team responded a question wrongly, the dollar value of that answer was deduced from the team's score. In contrast, when a team replied an answer correctly, the amount was added to the team's score. To play this game, students were divided into four teams. It was interesting, fun, and challenging because there

was a competition among the groups. As the game progressed a score appeared on the screen for each team, so the members helped each other to answer the next questions correctly in order to outperform other teams. Besides, each question had audio, text, images, sound, and a countdown timer. When the game ended the team with the highest amount of money was the winner.

Thus, five individual games and a team game were used by the investigator to assist the students of the experimental group in their English vocabulary building and retention. All these games comprised the four topics: body parts, food, clothing items, and jobs. Therefore, to study all these four topics during the period of time estimated for the fifth and sixth didactic units, all the six games were applied in each topic. The period of time to develop these topics was distributed as follows: food and body parts from April 9 to May 17, 2019, and clothing items and jobs from May 20 to June 26, 2019. While students were playing these online games on the computer lab, the investigator monitored the performance of the activities.

After eight sessions of EFL vocabulary training, three hours of classes per week, a post-test was administered to both groups of students: control and experimental groups, by using the Vocabulary Knowledge Scale as in the pretest. In this phase of the intervention, the same 36 words of the pre-test were considered to evaluate students' English vocabulary acquisition.

3.7 Data Analysis and Results.

The data processing and analysis of this research was executed on the Statistical Package for Social Sciences (SPSS) program, version 25. The investigator chose this computer

software because it is easy to use, fast in analyzing data, and has many statistical tests like ANOVA, allowing researchers to get relevant output representations of the data they have entered.

The results of this investigation are presented through measures of central tendency and dispersion that are the minimum, maximum, mean, standard deviation, and significant difference. According to the test of Kolmogorov Smirnov ($p<0.05$) this investigation obtained an irregular behavior of data because of its small sample size which included two groups of only twenty-eight students each one, and because of its abnormal distribution of data around the central value. Therefore, the following nonparametric tests were applied due to this irregularity in data behavior: The U test of Mann Whitney was used to compare the mean scores of the pre-test of both groups: experimental and control, in order to determine if there were small or big differences between the two groups prior to the treatment. Also, the test of Wilcoxon was applied to correlate the pre-test and post-test of both groups, in order to see the changes each group had got after intervention; and the ANOVA test was used for the repetitive measures to determine the effect of the variables, for which an alpha $a=0.05$ was considered.

3.7.1 Pre-test Outcomes

The vocabulary knowledge of each topic was measured by using a scale 9-45 and a total scale 36-180. The scale 9-45 points out that each topic had 9 questions and there was a minimum score of 9 points, meaning that some students got 1 mark in each question of a topic. Also, each theme encompassed a maximum score of 45 points because each question was worth 5 points and 9*5=45. Likewise, the scale 36-180 explains that there was a

minimum total score of 36 points because some students got 36 over 180 in the 4 topics. Besides, the 4 themes comprised a maximum total score of 180 points since each one had 45 marks and 45*4=180.

The results of the pre-test revealed that the experimental group had scores between 9 and 36 points; meanwhile, the control group got scores between 9 and 32 points in each topic, becoming “Body Parts” the topic that was more familiar to students of both groups, followed by “Food”, “Jobs” and “Clothes”. Both groups registered a minimum knowledge corresponding to one fifth of the total vocabulary score, and a maximum equivalent to half of the total score, meaning that at the beginning of the intervention, both groups had the same level of vocabulary knowledge about the four target topics. Also, high data dispersion was reported (CV>20%), implying a heterogeneous behavior, and there were no significant differences between the two groups (p>0.05). These outcomes of the pre-test revealed that at the beginning of the experiment both groups had a similar previous knowledge regarding the vocabulary of the four target topics. These results are demonstrated in table 1.

Table 1.

Pre-test results

Topic	Experimental group				Control group				p
	Min	Max	Mean	SD	Min	Max	Mean	SD	
BODY	12	36	22.5	8.4	10	32	22.3	7.4	0.843
FOOD	9	31	16.9	7.9	7	31	17.5	7.2	0.687
JOBS	9	23	11.9	4.8	9	22	12.3	5.0	0.604
CLOTHES	9	25	11.6	5.5	9	23	11.3	4.6	0.974
TOTAL	36	92	62.9	22.7	37	93	63.5	21.3	0.993

Source: Maria Celia Carrasco

3.7.2 Changes between the pre-test and the post-test got by the two groups

All the students of the experimental group demonstrated an improvement in the vocabulary knowledge in at least 5 points. There was a maximum of 36 points with a significant mean increase ($p<0.05$) between 17.8 points and 24.7, being "Jobs", "Food" and "Clothes" the topics with highest acquisition. The total score registered changes between 68 and 155 points with a mean increase of 89.5 points, and a low data dispersion (SD=13.1), revealing a homogeneous progress in vocabulary. These outcomes are described statistically in table 2.

Table 2.

Vocabulary acquisition: experimental group

	Minimum	Maximum	Mean	SD	p
Body	8	28	17.8	5.9	0.000*
Food	14	36	23.6	5.9	0.000*
Jobs	**7**	**35**	**24.7**	**5.5**	**0.000***
Clothes	5	35	23.4	7.1	0.000*
Total	68	115	89.5	13.1	0.000*

*Note: *p<0.05 (significant difference)*
Source: Maria Celia Carrasco

Regarding students of the control group, they got an increase in their vocabulary knowledge in at least 2 points. There was a maximum of 30 points in the evaluated topics, being "Clothes" the topic with highest acquisition, followed by "Jobs", "Food" and "Body Parts" in which this group demonstrated a low achievement. Despite this outcome, all the advances were significant ($p<0.05$). The total score showed an improvement between 58 and 89 points, with a mean of 70.7 and a low dispersion (SD=8.8). Details of these results are represented in table 3.

Table 3.

Vocabulary acquisition: control group

	Minimum	Maximum	Mean	SD	p
Body	2	20	13.4	4.2	0.000*
Food	6	25	16.1	4.8	0.000*
Jobs	5	26	18.1	4.5	0.000*
Clothes	**15**	**30**	**23.1**	**3.9**	**0.000***
Total	58	89	70.7	8.8	0.000*

*Note: *p<0.05 (significative difference)*
Source: Maria Celia Carrasco

Comparing the vocabulary acquisition between the two target groups, it was found that the experimental group achieved significantly better results than the control group ($p<0.05$) in the topics: "Body", "Food" and "Jobs", mainly in the topic "Food" with a difference of 7 points. Besides, the experimental group demonstrated a general vocabulary knowledge superior in 19 points. However, both groups revealed a similar vocabulary acquisition in the topic "Clothes" ($p>0.05$). These outcomes are demonstrated in table 4.

Table 4.

Vocabulary acquisition: experimental group vs control group

Topic	Experimental		Control		Difference	p
	Mean	SD	Mean	SD		
Body	17.8	5.9	13.4	4.2	4.4	0.007*
Food	**23.6**	**5.9**	**16.1**	**4.8**	**7.5**	**0.000***
Jobs	24.7	5.5	18.1	4.5	6.6	0.000*
Clothes	23.4	7.1	23.1	3.9	0.3	0.560
Total	89.5	13.1	70.7	8.8	18.8	0.000*

*Note: *p<0.05 (significative difference)*
Source: Maria Celia Carrasco

3.7.3 Post-test Outcomes

Regarding the post-test, the outcomes revealed that in both target groups the students obtained scores between 23 and 45 points in each topic. The experimental group had means rounding the 40 points, whereas the control group had means going around 35 points. The final mean score of the post test was significantly higher in the experimental group (M=152.4; SD= 14.7), demonstrating a score 1.4 times higher than the one obtained at the pre-test, comparing to the control group (M=134.2; SD= 17.2) that achieved a score 1.1 times higher. Details of the post-test outcomes are showed in table 5.

Table 5.

Post test results

	Experimental group				**Control group**				p
	Minimum	Maximum	Mean	SD	Minimum	Maximum	Mean	SD	
BODY	29	45	40.3	4.9	25	45	35.7	5.6	0.004*
FOOD	30	45	40.5	4.8	24	45	33.6	6.0	0.000*
JOBS	28	45	36.6	5.8	24	40	30.4	4.3	0.000*
CLOTHES	23	43	35.0	5.4	26	42	34.4	4.9	0.569
TOTAL	125	175	152.4	17.4	106	162	134.2	17.2	0.001*

*Note: *p<0.05 (significative difference)*
Source: Maria Celia Carrasco

Then an ANOVA of repeated measures (RM ANOVA) was applied to establish the influence that the group by itself, the passing time, and the interaction time-group had in the outcomes of the target students. It turned out that the group by itself did not have any influence in the results ($p<0.05$). In other words, if you detach the group of students from the time, the methodology, and from everything, in order to find out if this group by itself has a significant difference, then you find no change. Meanwhile, the passing time (F=

2872.08; p=0.000) implied 98.2% of the data variance, which means that regardless of the methodology, the learning time by itself has a significant effect in students' outcomes. The time-group interaction (F=39.48; p=0.000) influenced 42.2% in the students' outcomes. Namely, the methodology that is applied during a period of time does have a positive effect in students' achievement, helping them improve 42 % in their outcomes. This explanation is statistically represented in table 6.

Table 6.

Variables Intervention

	F	P	Partial Eta squared
Group	3.034	0.087	0.053
Time	2872.028	0.000*	0.982
Time – Group	39.486	0.000*	0.422

*Note: *p<0.05 (significant difference)*
Source: Maria Celia Carrasco

3.7.4 Outcomes according to the Ecuadorian Education System learning scale

Interpreting data in terms of the required outcomes according to the learning scale of Ecuadorian Education system, the results revealed that the experimental group got scores between 2.00 and 5.11 (M=3.49; SD=1.26) at the beginning of the investigation, implying that students did not reach the required learning, specifically 17 students were in this grading scale and 11 learners were close to achieve the required learning. Regarding the control group, it achieved scores between 2.06 and 5.17 (M=3.53; SD=1.18) with 15 students without accomplishing the required learning and 13 ones being close to reach the required learning.

After the intervention, the experimental group got scores between 6.94 and 9.72 (M=8.47; SD=0.96) meaning that 15 students achieved the required learning, 2 were close to reach the required learning, and 10 mastered the required learning. On the other hand, the control group got scores between 5.89 and 9.00 (M=7.45; SD=0.95), which implied that most students met the required learning, but with lower scores than the experimental group. So, after taking the post test, 10 students of the control group were close to reach the required learning, 16 ones got the required learning and 2 mastered the required learning. See these results in figure 3.

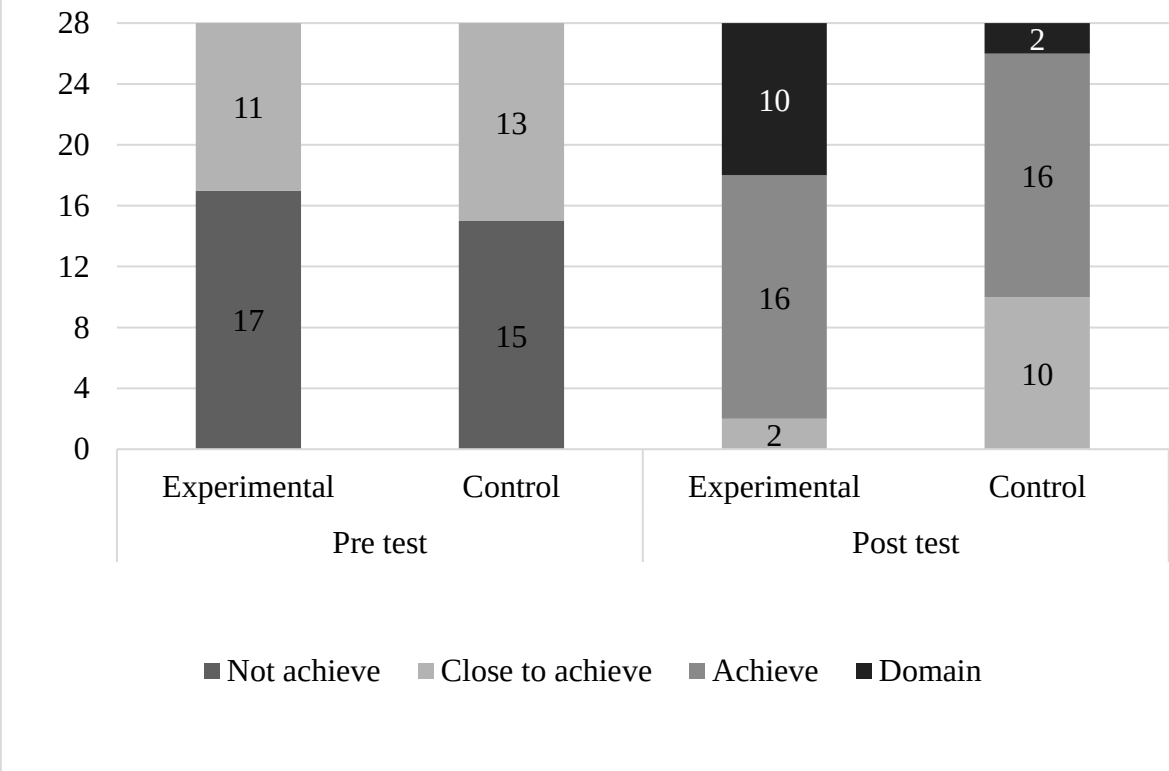

***Figure 3**: Outcomes according to Ecuadorian Education system learning scale.*
Source: Maria Celia Carrasco

3.7.5 Motivation and Fun Perception results

Experimental group students' motivation and fun perception to learn English vocabulary through educational computer games were also assessed. The results revealed that only one student has a neutral stance; whereas 7 students agreed and 20 totally agreed that virtual game-based learning approach motivated them to learn English vocabulary. Concerning fun perception to learn English vocabulary through educational computer games 21 students totally agreed, 6 agreed and only one had a neutral attitude. See this interpretation in figure 4.

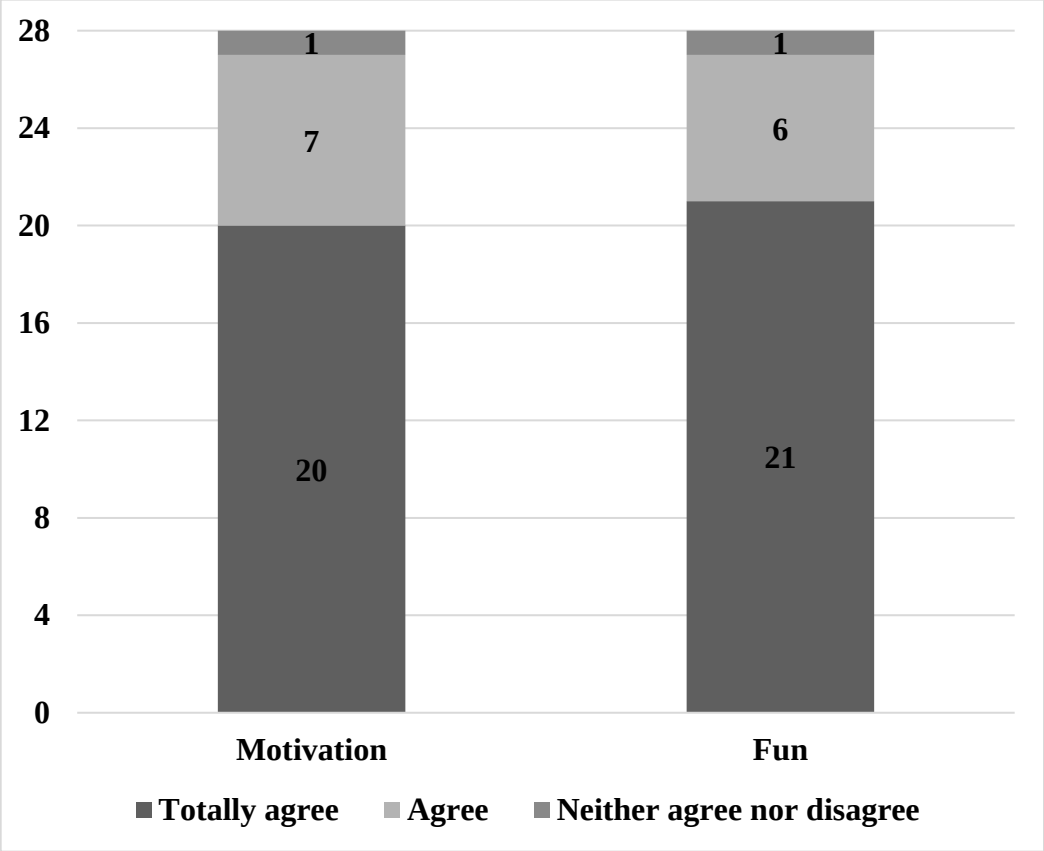

Figure 4. *Results of students 'motivation and fun perception to learn English vocabulary through educational computer games.*
Source: Maria Celia Carrasco

To sum up this chapter, it can be stated that this intervention was applied to children who attended the sixth grade at a public school. At the beginning of the study there were not significant differences between the experimental and control group of students, which helped met the requirement to start this quasi-experimental research. After the intervention both target groups demonstrated that they learned significantly; however, the experimental group scored 1.4 times higher in the post-test than in the pre-test; meanwhile, the control group scored 1.1 higher in the post-test than in the pre-test. This means that the experimental group outperformed the control group and the computer game-based approach resulted more effective than traditional methods to instruct English vocabulary learning. According to the Ecuadorian Education system learning scale, at the beginning of the experiment none of the students of both groups met the required learning because new words were evaluated; however, after the treatment, most students of both groups accomplished the required learning and some of them mastered the required learning, especially the experimental group had more students who reached and mastered the required learning than the control group. Also, the students of the experimental group were motivated and found amusement to learn English vocabulary through interactive educational computer games.

CHAPTER IV: Discussion, Limitations, Conclusions, and Recommendations

This last chapter comprises the important findings gathered in this research, the limitations of this study, the suggestions for further research, the relevant conclusions drawn basing on the results and findings, and the recommendations for Ecuadorian English language teachers as well as for investigators in virtual game-based approach to foster English language acquisition.

4.1 Discussion

The results of this investigation asserted the hypothesis established in chapter one and demonstrated evident responses for the two questions posed previously. Grounding on the post-test outcomes of both groups of students as well as on the results of the 5-point Likert-scale questionnaire, this study gathered the next findings:

First, it was founded that interactive educational computer games were more effective and amusing for young learners' English vocabulary acquisition than conventional strategies because they presented information through different multimedia such as written texts, images, audio, and animation. Second, this novel approach enabled sixth graders to actively and willingly participate in classroom learning activities, reducing the fear of making mistakes and getting instant feedback for wrong answers. Additionally, the students of the experimental group had a positive achievement in the post-test due to the fact that they learned the target vocabulary through six interactive educational computer games, which provided them repeated exposures to new words and phrases in the phonological and semantic levels of language. Besides, while students were developing the tasks by means of computer games, they were unconscious that they were engaged in learning English.

Another finding is that computer games strengthened sixth graders English vocabulary acquisition because they were student-centered and developed learners' autonomy, meaning that children could practice freely the online vocabulary exercises anywhere and anytime by opening the links provided by the teacher. Furthermore, virtual team games fostered competition and collaborative participation among learners. For instance, while playing the jeopardy games, students of the experimental group felt motivated to compete with other teams and helped each other to answer the questions correctly and outperform other teams. Overall, computer games enhanced students' motivation and self-confidence, and helped them retain information.

The findings of this investigation through statistical analysis revealed that the experimental group achieved a significant improvement in the post-test, registering a mean score 1.4 times higher than the one obtained in the pre-test. Likewise, comparing the mean scores of both groups at the end of the treatment, the experimental group accomplished a better level of vocabulary knowledge superior in 19 points than the control group. These statistical results confirm that sixth graders learn English vocabulary better in classroom environments that involve ICT tools than in traditional classrooms. Also, in the light of this result, computer game-based approach is more potential to teach English vocabulary than traditional strategies such as memorization, drilling, and translation.

These results are in line with the following previous studies. Lin (2010) and Abdullatif (2017) pointed out that the incorporation of computer games in second language classrooms was better for students because they were exposed to visual and aural contexts perceiving English words and phrases simultaneously. Yip and Kwan (2006) discovered that computer games developed a higher degree of students' autonomy since they could be in control of

their own learning when practicing online vocabulary exercises from free websites anywhere and anytime. Lui (2012), Vasileiadou and Makrina (2017), Franciosi (2017), and Wei, Kao, and Lui (2018) affirmed that students preferred using computer games to using traditional materials to learn English vocabulary since these interactive activities were enjoyable, interesting, relaxing, and motivating, and helped them recall new encountered words and phrases easily. AlNatour & Hijazi (2018) and Korkmaz (2013) claimed that electronic games involved young learners' engagement, competition, and dynamic participation when carrying out a particular activity. Also, these investigators stated that teachers needed to implement cooperative games to reduce students' anxiety and bring more amusement into the classroom.

4.2 Limitations and Further Research

Although the outcomes of this investigation have revealed some interesting findings, some limitations should be observed. One of them is that the assigned number of English classes for primary education in Ecuadorian public schools are only three hours a week, implying that the computer game-based methodology was implemented only in thirty-two periods of English classes. So, the results of this investigation cannot be generalized to other Ecuadorian schools, especially to the private ones, which have more hours of English classes per week than public educational institutions. Also, the use of a small population makes the findings of this study difficult to generalize. Thus, this research outcomes would be more representative with more subjects. Another limitation is that most virtual team games that are on websites cannot be easily adjusted to specific topics as individual computer games are. Therefore, language instructors, in order to adapt the team games to

the class contents, have to update knowledge on the use of platforms for creating individual and team games. Sometimes, it is necessary to pay cheap plans to create own games.

It is worthwhile to further investigate the implementation of interactive educational online games to enhance students' listening and speaking skills since the present research focused mostly on games for vocabulary acquisition. Seemingly, virtual games contrived to improve listening and speaking skills will bring more authentic contexts into the classroom, and in turn, they will involve more active participation and cooperation among students. Also, a further research implying educational online games to enhance the learning of English grammatical structures would be an interesting topic because most EFL learners dislike English grammar and feel bored and confused when studying this area through ordinary classroom instruction.

4.3 Conclusions

The contemporary world has become more technology driven and dependent on gadgets such as computers, laptops, mobiles, and tablets. So, most fields of study have subjected to these new global trends based on technology advancements. In the area EFL/ESL students' need to learn vocabulary in a suitable way that copes with the modern world technologies has become evident since traditional strategies such as memorization, translation, and repetition drill have produced anxiety, boredom, and sporadic learning on students, due to the fact that these traditional ways of language instruction focus on teaching vocabulary out of context (Alsharafat, Alrashdan, & Bani, 2017). The implementation of interactive educational computer games in EFL/ESL classrooms has helped English teachers gradually diminish and overcome these drawbacks since this new approach offers students many benefits to achieve permanent learning. Among them are authentic contexts for

communication, relaxed and enjoyable settings for learning, repeated exposures to new words and phrases, instantaneous feedback for all answers, presentation of information through different multimedia features, autonomy to work at their own pace, cooperative work, and friendly competition.

Particularly, this study has showed that elaborating classroom activities based on more than three interactive online games intensifies students' English vocabulary development because varied language games provide teachers and learners opportunities to break from ordinary exercises from which most students are tired of. Apparently, different online games give students lots of exposures to new vocabulary words displayed through text, images, accurate English pronunciation, and examples of how they are used in real communication, which, in turn, are essential components for vocabulary acquisition. Specifically, team games enable students to develop not only L2 vocabulary knowledge, but also social team-working skills and other values such as effective communication, responsibility when taking roles, collaboration, supporting others, listening to other members, building interpersonal relationships, and critical thinking.

Furthermore, this study has demonstrated that there is a way to leave behind outdated classroom scenarios and old-fashioned material resources by supplementing them with others that latest technologies offer. In this manner, through online computer games students can experience new relaxing and appealing classroom climates built with virtual interactive elements like avatars. Besides, this novel approach of learning lets students and educators use during classes devices that the modern world has brought to our daily lives such as computers, laptops, smart cellphones, and tablets. Instead of doing the classroom

activities on a piece of paper writing by hand, students can perform the same exercises online faster and get their grades immediately, which, in fact, helps teachers save a lot of time scoring students' tasks one by one.

All in all, the results of this investigation have shown that teaching and learning English vocabulary through varied educational computer games lead to effective outcomes with students, especially with young learners who are nine or ten years old, compared to conventional methods which prevail rote learning and the use of obsolete classroom scenarios. In addition, this research has proved that educational computer games do enhance students' motivation and self-confidence to continue learning English.

4.4 Recommendations

Underpinned by the results of this study, the researcher recommends other Ecuadorian English teachers to do the following actions. To become a modern English language instructor, English teachers should train on how to use software platforms that let create individual and team virtual games because some existent online games cannot be adjusted to the learners' English proficiency level and to the contents studied in classes. Similarly, to incorporate virtual games in the teaching learning process of English, teachers should choose games that have clear pronunciation, adequate written form, and good images of the contexts they present, so that learners can get appropriate spoken and written inputs while playing games. Additionally, English teachers are recommended to left behind the traditional strategies to teach English by implementing novel strategies through ICT tools, to enhance not only vocabulary acquisition, but also grammar competence and the main four language skills: listening, speaking, reading, and writing. Furthermore, English

language teachers should renovate their professional development to be able to create online quizzes, presentations, collaborative lessons, and other interactive activities by using the different platforms, in order to help students learn English adequately and utilizing the modern world technologies.

Regarding the investigators, the researcher suggests them the following: If they are going to carry out an investigation to enhance vocabulary acquisition or the four main language skills through virtual game-based approach, they should use a large population more than 60 subjects and conduct the treatment in a period of time that encompasses more than 35 hours of English classes, so that the results of the investigation can be more representative.

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Appendices

Appendix A: Consent form for participants

UNVERSIDAD DE CUENCA

FACULTAD DE FILOSOFÍA, LETRAS Y CIENCIAS DE LA EDUCACIÓN

CENTRO DE POSGRADO

MAESTRÍA EN LINGÜÍSTICA APLICADA A LA ENSEÑANZA DEL INGLÉS COMO LENGUA EXTRAJERA

CONSENTIMIENTO PARA REPRESENTANTES DE LOS ESTUDIANTES QUE PARTICIPAN EN LA INVESTIGACIÓN.

"Implementing Interactive Educational Computer Games in an EFL classroom to foster Vocabulary Acquisition in Sixth Graders at "Victor Gerardo Aguilar" School"

Estimado padre/madre de familia:

Mi persona, en calidad de estudiante del programa de Maestría en Lingüística Aplicada a la Enseñanza del Inglés como Lengua Extranjera en la Universidad de Cuenca, me dirijo a usted, de la manera más respetuosa, para solicitar, me conceda el permiso correspondiente para que su representado/a participe en una Investigación Empírica, el cual se desarrollará durante el segundo quimestre del presente año lectivo 2018- 2019, siendo este trabajo de investigación un requisito indispensable para graduarme del programa de postgrado antes mencionado. Es necesario indicar que los estudiantes del sexto grado, paralelos "A" y "B" han sido seleccionados por la investigadora como sujetos de este estudio experimental.

El objetivo de este trabajo es implementar juegos electrónicos educativos e interactivos en las clases de Inglés para que su representado aprenda el Vocabulario del idioma Inglés de manera autónoma, natural y divertida. Además, este experimento pretende medir el grado de

efectividad que tiene el uso de juegos educativos virtuales en el aprendizaje del vocabulario en Inglés de los estudiantes del sexto grado.

La información obtenida mediante el presente estudio será mantenida bajo estricta confidencialidad y el nombre de su representado no será visualizado de ninguna manera. También la participación de su niño/a en la presente investigación no afectará de ninguna manera en las calificaciones de esta materia durante todo el año lectivo 2018-2019. Si por alguna razón y en cualquier momento, su representado/a decide no continuar en el proceso de esta investigación, estará en todo el derecho de hacerlo, sin verse perjudicado en sus actividades académicas.

Una vez que usted ha leído y entendido el contenido de este documento, usted, a través de su firma, voluntariamente concede la autorización para que su representado/a participe en la investigación antes mencionada.

Investigador/a: Lcda. María Celia Carrasco P.

Nombre del Representante: ……

Firma: ……

Fecha: ……

Appendix B: Pre-test and Post-test

"VICTOR GERARDO AGUILAR" SCHOOL	PRE-TEST AND POST-TEST TO MEASURE ENGLISH VOCABULARY KNOWLEDGE	SCHOOL-YEAR 2018-2019

LEVEL: Children A1.1	**AREA:** English as a Foreign Language	**SUBJECT:** English	**TEACHER (Researcher)** Lcda. Maria Celia Carrasco.
GRADE: 6th EGB.	**GROUPS:** "B" and "C"	**QUIMESTER:** Second	
STUDENT'S CODE:	**AGE:**	**SEX:**	**DATE:**

VOCABULARY KNOWLEDGE SCALE

Read carefully the VKS (Vocabulary Knowledge Scale) below:

VOCABULARY KNOWLEDGE SCALE	
1.	I do not know what this word means.
2.	I have heard this word before, but I do not know what it means.
3.	I have heard this word before, and I think it means _____ (synonym or translation).
4.	I know this word. It means _____ (synonym or translation).
1.	I can use this word in a sentence: _____.

After reading the 5 items of VKS rate yourself how well you know the 35 words bellow. If you choose item 1 or item 2 put an "X" in the corresponding box; for items 3 and 4 write the synonym in English or the translation in Spanish; and If you choose item 5, write a sentence using the word.

WORDS	1 	2 	3 	4 	5 	MARK
Nose			Synonym or translation:	Synonym or translation:	Sentence:	
Hair			Synonym or translation:	Synonym or translation:	Sentence:	
Eyes			Synonym or translation:	Synonym or translation:	Sentence:	
Hand			Synonym or translation:	Synonym or translation:	Sentence:	
Knee			Synonym or translation:	Synonym or translation:	Sentence:	
Legs			Synonym or translation:	Synonym or translation:	Sentence:	

WORDS	1 	2 	3 	4 	5 	MARK
Shoulders			Synonym or translation:	Synonym or translation:	Sentence:	
Arms			Synonym or translation:	Synonym or translation:	Sentence:	
Foot			Synonym or translation:	Synonym or translation:	Sentence:	
Noodles			Synonym or translation:	Synonym or translation:	Sentence:	
Milk			Synonym or translation:	Synonym or translation:	Sentence:	
Fish			Synonym or translation:	Synonym or translation:	Sentence:	
Chicken			Synonym or translation:	Synonym or translation:	Sentence:	
Eggs			Synonym or translation:	Synonym or translation:	Sentence:	
Pineapple			Synonym or translation:	Synonym or translation:	Sentence:	
Water			Synonym or translation:	Synonym or translation:	Sentence:	
Grapes			Synonym or translation:	Synonym or translation:	Sentence:	
Rice			Synonym or translation:	Synonym or translation:	Sentence:	
Farmer			Synonym or translation:	Synonym or translation:	Sentence:	
Doctor			Synonym or translation:	Synonym or translation:	Sentence:	

WORDS	1 	2 	3 	4 	5 	MARK
Mechanic			Synonym or translation:	Synonym or translation:	Sentence:	
Pilot			Synonym or translation:	Synonym or translation:	Sentence:	
Teacher			Synonym or translation:	Synonym or translation:	Sentence:	
Driver			Synonym or translation:	Synonym or translation:	Sentence:	
Waiter			Synonym or translation:	Synonym or translation:	Sentence:	
Nurse			Synonym or translation:	Synonym or translation:	Sentence:	
Firefighter			Synonym or translation:	Synonym or translation:	Sentence:	
Gloves			Synonym or translation:	Synonym or translation:	Sentence:	
Shirt			Synonym or translation:	Synonym or translation:	Sentence:	
T-shirt			Synonym or translation:	Synonym or translation:	Sentence:	
Shoes			Synonym or translation:	Synonym or translation:	Sentence:	
Socks			Synonym or translation:	Synonym or translation:	Sentence:	
Dress			Synonym or translation:	Synonym or translation:	Sentence:	
Coat			Synonym or translation:	Synonym or translation:	Sentence:	
Suit			Synonym or translation:	Synonym or translation:	Sentence:	
Scarf			Synonym or translation:	Synonym or translation:	Sentence:	
TOTAL					**EQUIVALENCE: 180/180**	

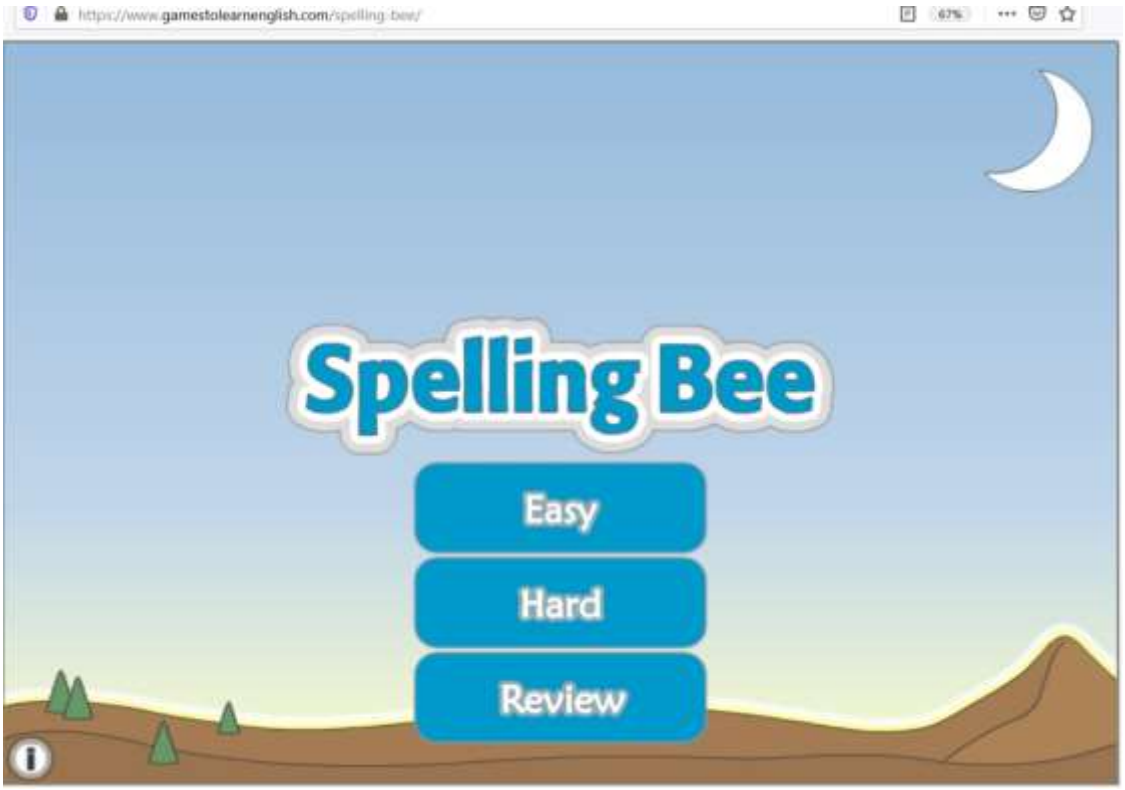
Appendix C: Experimental group students' achievement in the pre-test and post-test, and results of the 5-point Likert scale questionnaire

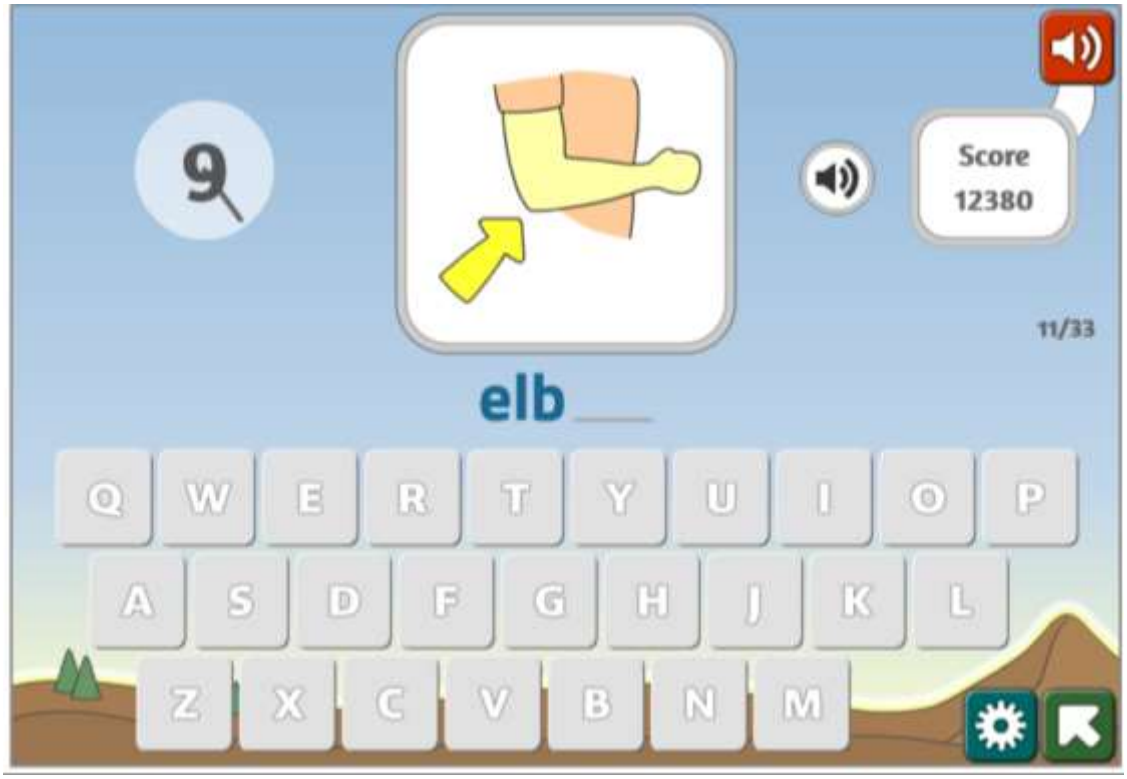
RESULTS OF THE EXPERIMENTAL GROUP														
STUDENTS		PRE-TEST					POST-TEST					5-point Likert scale questionnaire about Motivation and Fun perception	
ID	SEX	TOPIC 1 BODY	TOPIC 2 FOOD	TOPIC 3 JOBS	TOPIC 4 CLOTHES	TOTAL	TOPIC 1 BODY	TOPIC 2 FOOD	TOPIC 3 JOBS	TOPIC 4 CLOTHES	TOTAL	MOTIVATION	FUN PERCEPTION
1	1	13	11	7	5	36	29	36	30	30	125	Totalmente de acuerdo	Totalmente de acuerdo
2	2	12	12	9	10	43	35	34	30	37	136	Totalmente de acuerdo	Totalmente de acuerdo
3	1	16	20	13	8	57	42	44	42	43	171	Totalmente de acuerdo	Totalmente de acuerdo
4	1	30	29	17	14	90	44	45	45	40	174	Totalmente de acuerdo	Totalmente de acuerdo
5	1	36	31	16	9	92	45	45	43	41	174	De acuerdo	De acuerdo
6	2	33	30	17	7	87	45	44	40	40	169	Totalmente de acuerdo	Totalmente de acuerdo
7	1	13	11	8	8	40	39	40	33	29	141	De acuerdo	De acuerdo
8	2	30	21	16	20	87	45	45	40	40	170	Ni en acuerdo ni en desacuerdo	Ni en acuerdo ni en desacuerdo
9	2	35	19	17	19	90	45	43	45	37	170	De acuerdo	De acuerdo
10	1	20	12	6	9	47	40	45	40	37	162	Totalmente de acuerdo	Totalmente de acuerdo
11	2	27	15	15	10	67	45	45	39	40	169	Totalmente de acuerdo	Totalmente de acuerdo
12	1	14	12	9	8	43	40	30	30	30	130	Totalmente de acuerdo	Totalmente de acuerdo
13	1	32	30	15	14	91	45	45	41	43	174	De acuerdo	De acuerdo
14	1	30	20	8	10	68	40	45	40	35	160	Totalmente de acuerdo	Totalmente de acuerdo
15	2	35	30	15	10	90	45	45	45	40	175	Totalmente de acuerdo	Totalmente de acuerdo
16	2	16	10	5	5	36	32	35	28	30	125	Totalmente de acuerdo	Totalmente de acuerdo
17	1	27	13	8	15	63	35	40	29	35	139	Totalmente de acuerdo	Totalmente de acuerdo
18	2	15	9	8	5	37	35	33	32	30	130	De acuerdo	Totalmente de acuerdo
19	1	20	9	10	10	49	37	45	40	38	160	De acuerdo	De acuerdo
20	1	17	9	5	7	38	33	36	40	38	147	Totalmente de acuerdo	Totalmente de acuerdo
21	1	15	5	9	11	40	35	35	34	29	133	Totalmente de acuerdo	Totalmente de acuerdo
22	2	24	20	23	20	87	45	40	30	40	155	Totalmente de acuerdo	Totalmente de acuerdo
23	1	27	23	17	22	89	45	45	35	33	158	Totalmente de acuerdo	Totalmente de acuerdo
24	1	12	10	11	12	45	40	40	36	23	139	De acuerdo	De acuerdo
25	2	12	10	7	9	38	37	35	30	26	128	Totalmente de acuerdo	Totalmente de acuerdo
26	2	30	25	13	17	85	45	45	33	35	158	Totalmente de acuerdo	Totalmente de acuerdo
27	2	14	11	10	5	40	40	40	30	30	140	Totalmente de acuerdo	Totalmente de acuerdo
28	2	26	16	19	25	86	45	35	45	30	155	Totalmente de acuerdo	Totalmente de acuerdo

Appendix D: Control group students' achievement in the pre-test and post-test

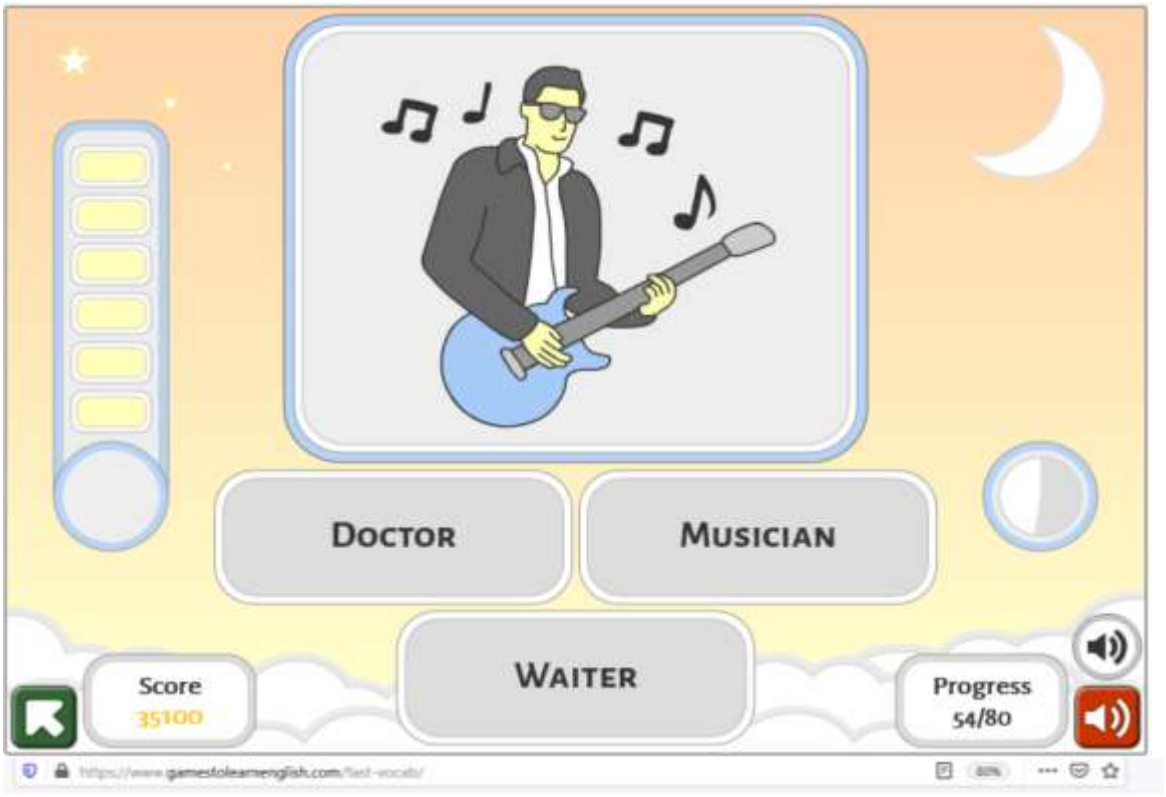
RESULTS OF THE CONTROL GROUP											
STUDENTS		PRE-TEST					POST-TEST				
ID	SEX	TOPIC 1 BODY	TOPIC 2 FOOD	TOPIC 3 JOBS	TOPIC 4 CLOTHES	TOTAL	TOPIC 1 BODY	TOPIC 2 FOOD	TOPIC 3 JOBS	TOPIC 4 CLOTHES	TOTAL
1	2	25	24	15	16	80	40	36	33	32	141
2	1	27	19	20	15	81	42	35	36	30	143
3	2	25	25	10	10	70	38	38	32	40	148
4	1	27	22	18	12	79	35	29	32	41	137
5	1	29	23	17	13	82	31	45	30	42	148
6	2	30	25	10	14	79	40	31	29	37	137
7	1	10	11	11	8	40	25	25	30	26	106
8	1	20	10	6	10	46	33	29	32	31	125
9	1	16	13	7	8	44	30	35	28	29	122
10	1	20	15	12	10	57	38	40	29	39	146
11	2	29	31	13	20	93	39	45	36	40	160
12	1	15	7	9	8	39	30	25	24	33	112
13	1	30	20	10	14	74	36	38	26	37	137
14	1	30	23	18	10	81	41	38	37	33	149
15	1	32	25	16	18	91	45	37	40	40	162
16	2	16	10	8	5	39	30	25	24	28	107
17	1	12	10	10	6	38	32	30	32	29	123
18	1	15	7	8	7	37	35	31	27	32	125
19	1	30	22	18	14	84	42	35	28	40	145
20	2	30	28	22	8	88	40	40	36	35	151
21	1	15	7	9	6	37	28	24	27	28	107
22	1	10	13	7	8	38	30	26	25	29	110
23	1	13	10	10	6	39	30	30	27	29	116
24	1	25	10	5	12	52	35	33	29	35	132
25	2	21	15	8	10	54	35	30	30	34	129
26	1	13	22	9	8	52	30	32	30	35	127
27	1	29	24	20	18	91	45	40	25	40	150
28	2	30	20	19	23	92	45	40	37	40	162

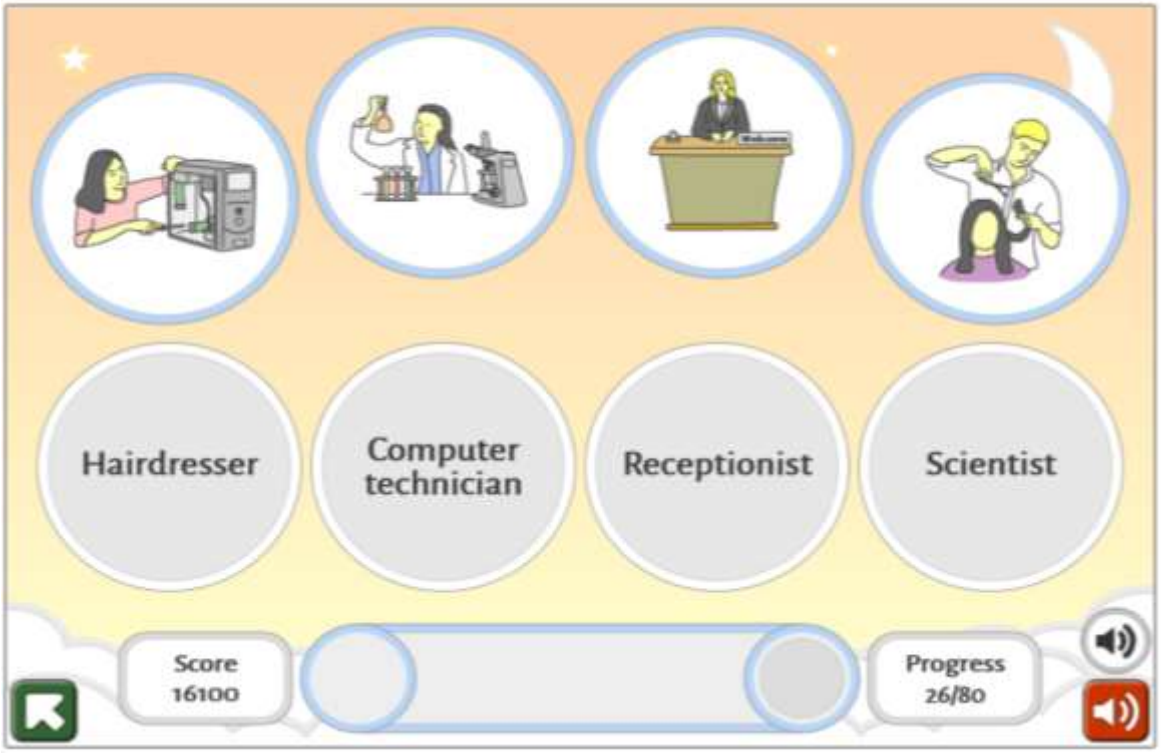
Appendix E: Spelling Bee Game



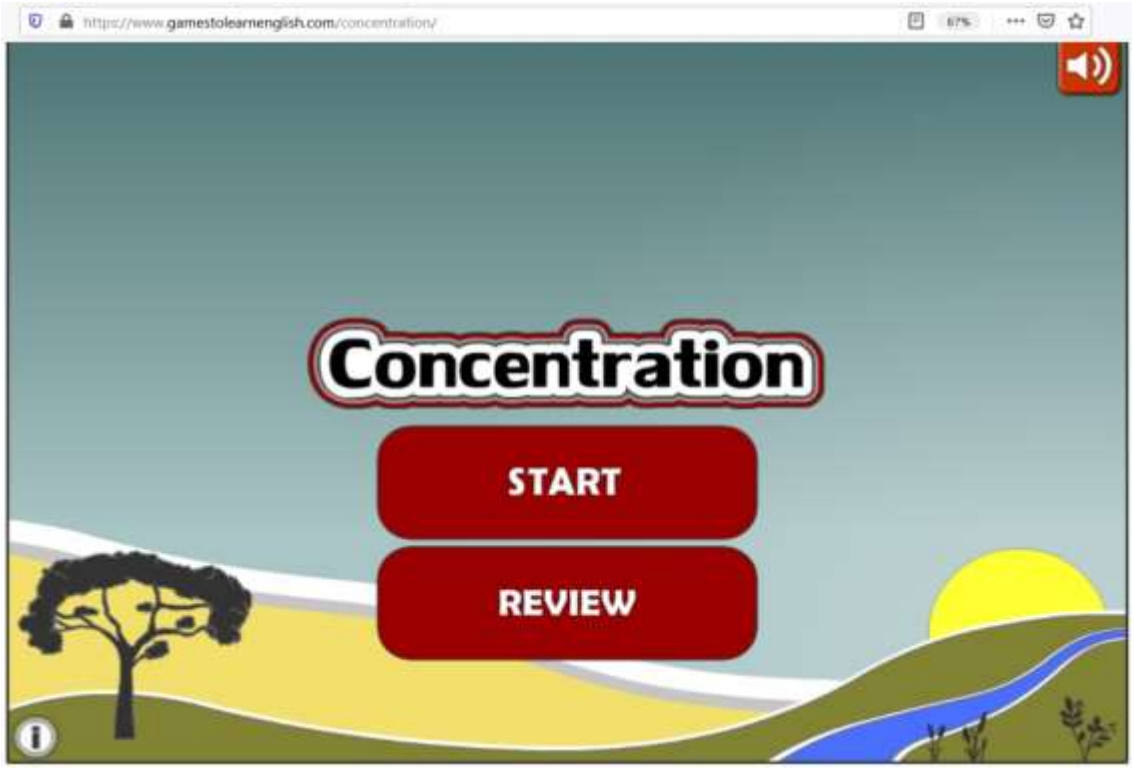


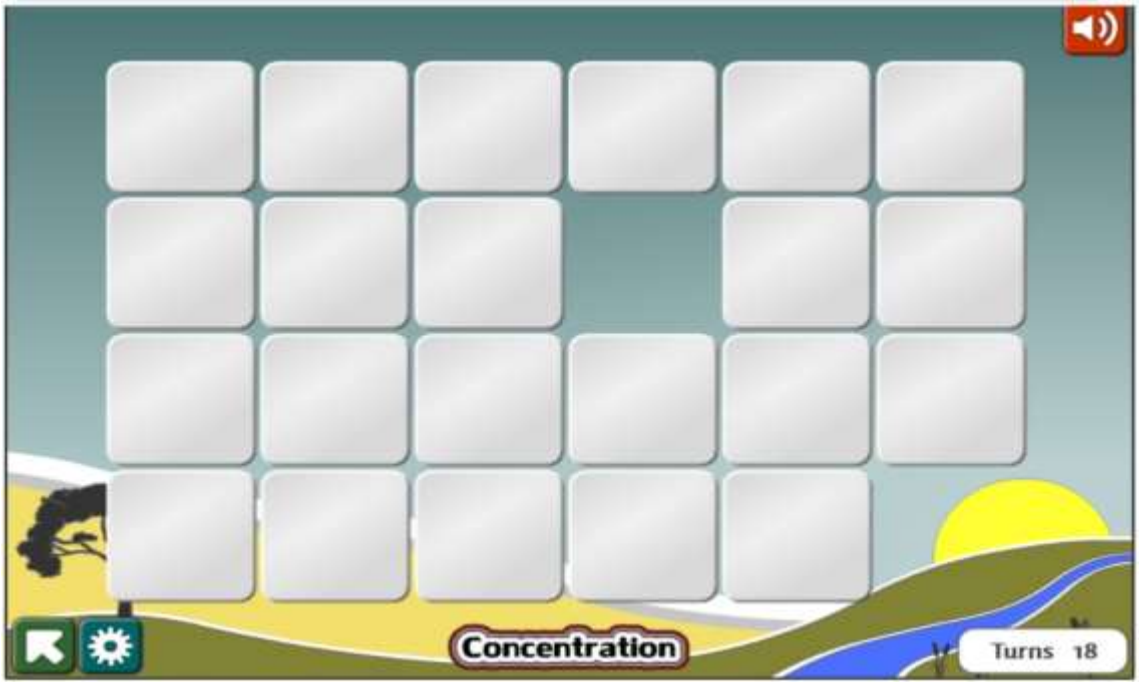
Appendix F: Matching Game



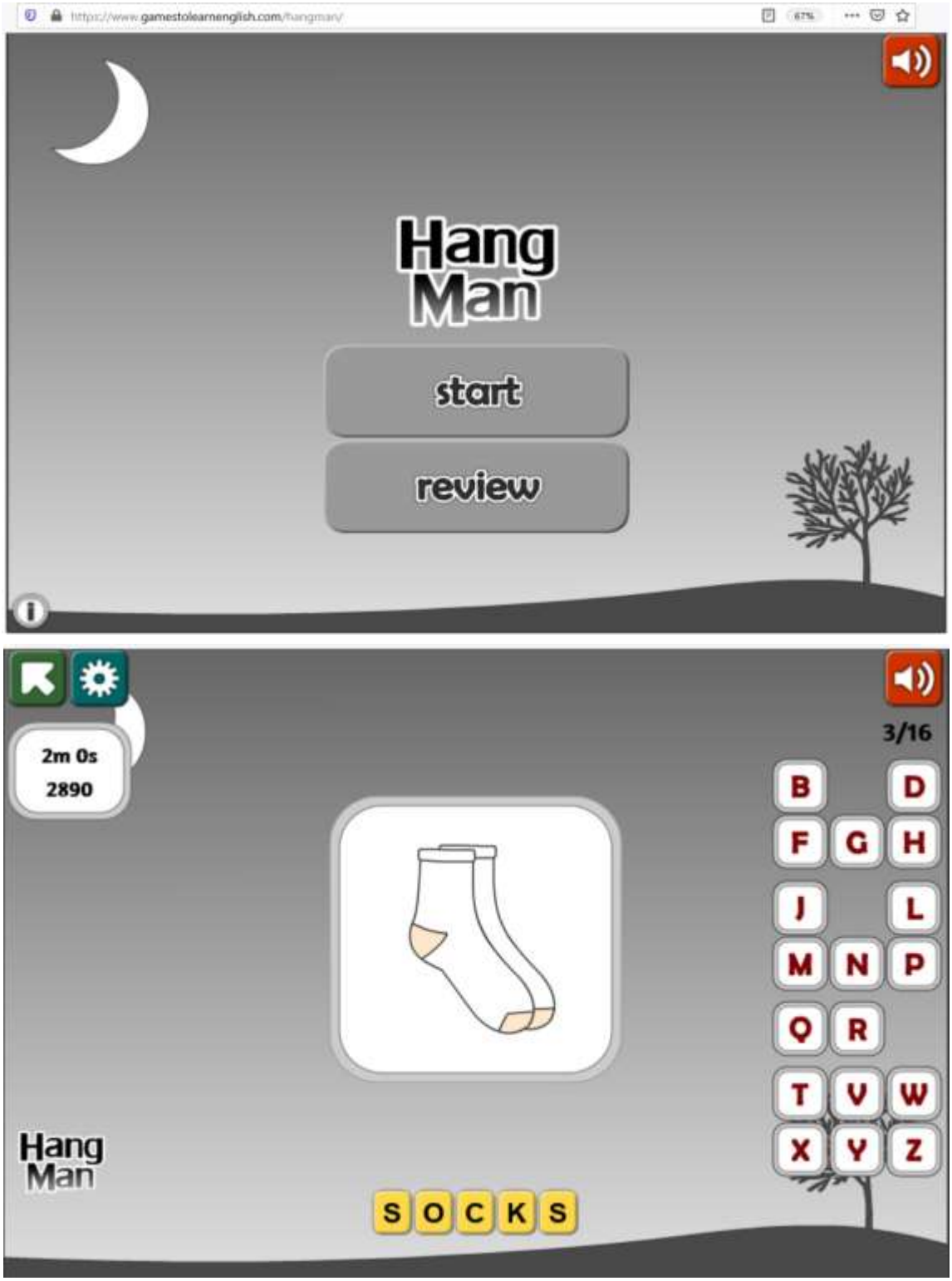


Appendix G: Concentration Game:

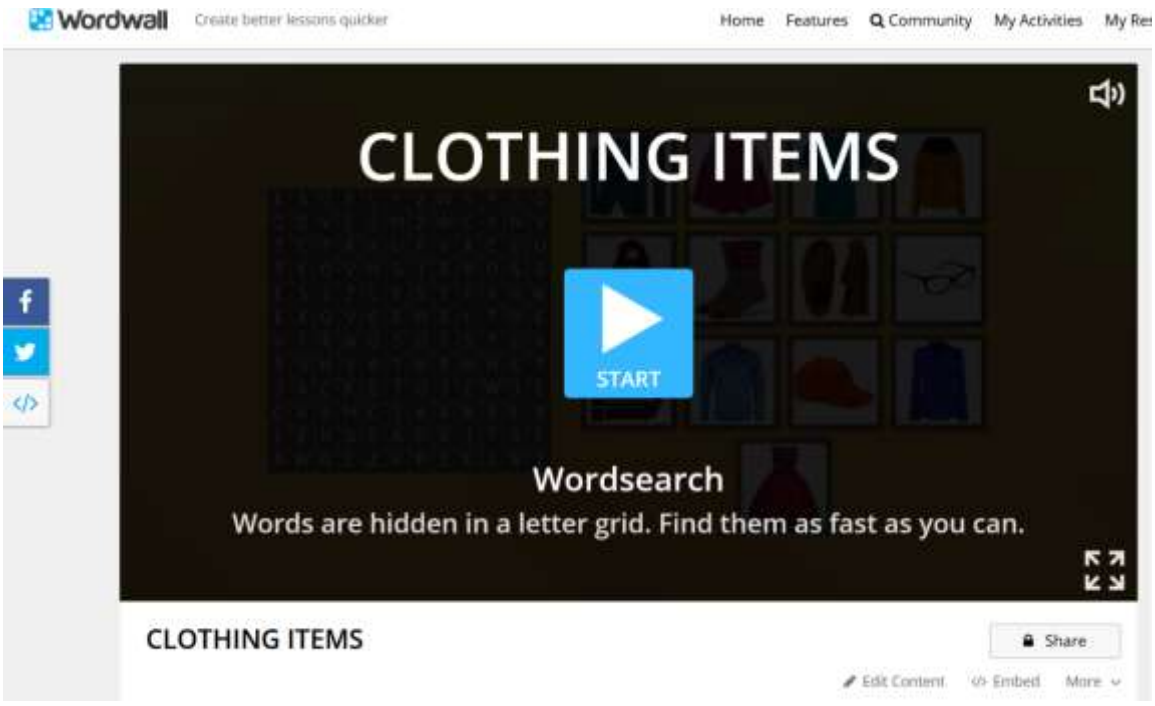


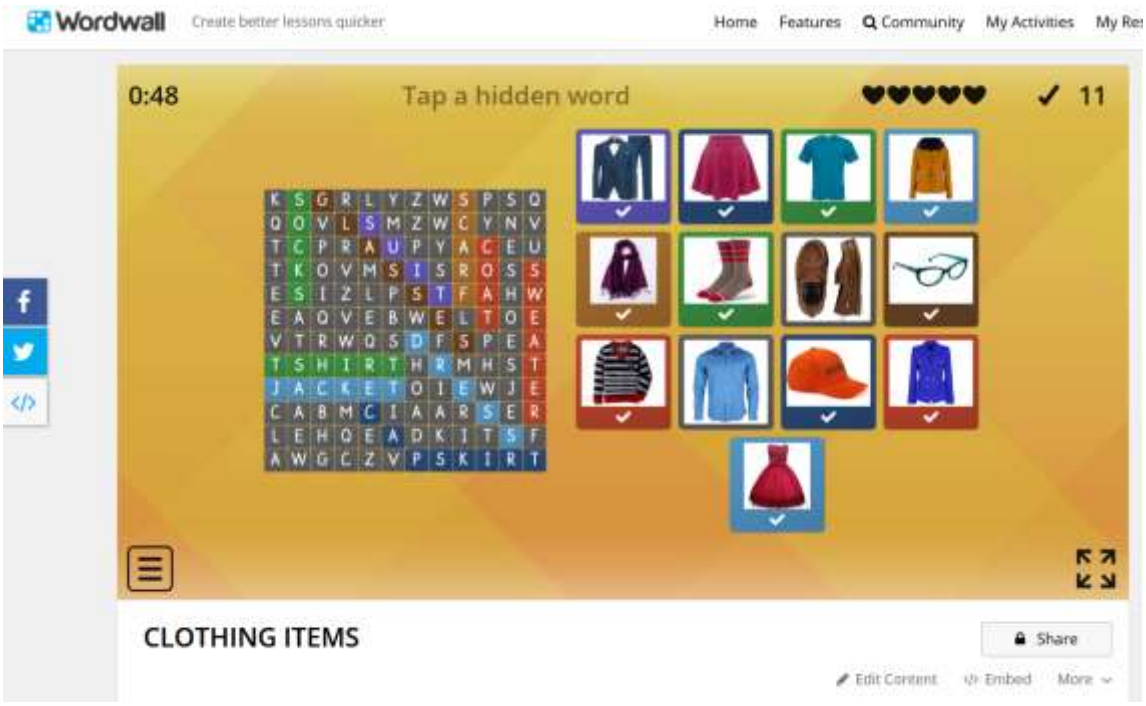


Appendix H: Hangman game:



Appendix I: Wordsearch Game





APPENDIX J: Jeopardy Game

APPENDIX K: The Experimental group working in the computer lab